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# FCB OVERCOUNTER POST-MIX DISPENSER

## WITH V3 ELECTRONICS

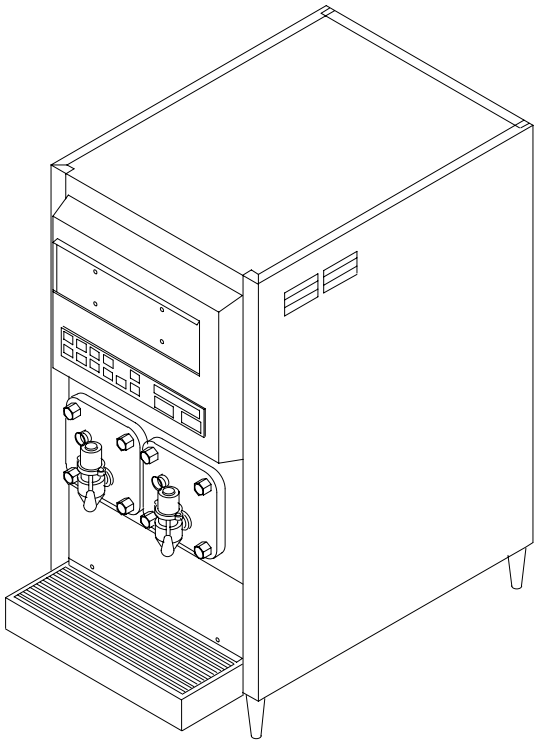
## Service Manual

**IMPORTANT:**

**TO THE INSTALLER.**

**It is the responsibility of the Installer to ensure that the water supply to the dispensing equipment is provided with protection against backflow by an air gap as defined in ANSI/ASME A112. 1.2-1979; or an approved vacuum breaker or other such method as proved effective by test.**

**Water pipe connections and fixtures directly connected to a potable water supply shall be sized, installed, and maintained according to Federal, State, and Local laws.**



Part No. 324229-000
January 9, 1990
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Control Code A

THIS DOCUMENT CONTAINS IMPORTANT INFORMATION
This Manual must be read and understood before installing or operating this equipment

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# GENERAL DESCRIPTION

This section gives the description, theory of operation, and design data for the Two-Flavor FCB (Frozen Carbonated Beverage) Overcounter Post-Mix Dispenser with Electric Defrost (hereafter referred to as a Unit).

**IMPORTANT: *To the user of this manual* – This manual is a guide for installing, operating, and maintaining this equipment. Refer to the Table of Contents for page location for detailed information pertaining to questions that arise during installation, operation, service, or maintenance of this equipment.**

## UNIT DESCRIPTION

The Unit (see Figure 1) consists basically of two freeze cylinders each containing an internal beater driven by an electric motor, one carbonator which feeds both carbonator-blender tanks, an electronically controlled automatic electric defrost system to defrost the freeze cylinders, and interconnecting tubing, components and fittings necessary to regulate, transfer and dispense product. The components are attached to a steel frame and are enclosed in a steel cabinet. The cabinet panels are easily removed to facilitate installation and service and maintenance. A transparent faceplate, with an integral relief valve and a removable self-closing dispensing valve, is mounted on front of each freeze cylinder. A removable drip tray, with a cup rest, is located directly below the dispensing valves.

**IMPORTANT: The Two-Flavor FCB Post-Mix Dispenser (Evaporator Unit) *must* be used in con-junction with the Remote Refrigeration Assembly P/N 416117XXX (60 HZ) or 496117XXX (50 HZ). The FCB Overcounter Dispenser freeze cylinders evaporator coils are connected by refrigeration lines to and are refrigerated by the Remote Refrigeration Assembly.**

**CAUTION: Before shipping, storing, or relocating this Unit, the syrup systems *must* be sanitized and all sanitizing solution *must* be purged from the syrup systems. All water *must* also be purged from the plain and carbonated water systems. A freezing ambient environment will cause residual water in the Unit to freeze resulting in damage to internal components.**

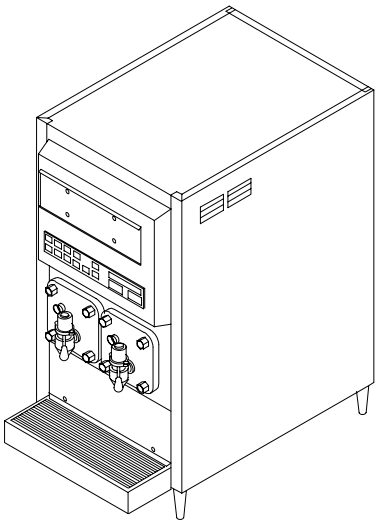

**FIGURE 1. FCB OVERCOUNTER POST-MIX DISPENSER (EVAPORATOR UNIT)**

| Table 1. Design Data | |
|---|---|
| **FCB OVERCOUNTER DISPENSER DATA** | |
| | |
| Unit Part Numbers: | |
| 60HZ | 416116xxx |
| 50HZ | 496116xxx |
| | |
| Overall Dimensions: | |
| Height | 26-1/4 inches |
| Width | 18-1/4 inches |
| Depth Without Drip Tray | 24 inches |
| Depth With Drip Tray | 30-1/4 inches |
| | |
| Shipping Weight (approx.) | 212 pounds |
| | |
| Refrigeration System: | |
| Refrigerant Type and Charge | See Unit Nameplate |
| | |
| Ambient Operating Temperature | 40° F to 100° F |
| | |
| Electrical Requirements: | |
| Operating Voltage | See Unit Nameplate |
| Current Draw | See Unit Nameplate |

**Table 2. Accessories and Tools**

| **ACCESSORIES** | |
|---|---|
| Installation kits | 1155 |
| Cup Holder | 511005000 |
| Cup Holder | 511006000 |
| $CO_2$ Changeover Kit | 511035000 |
| Seal Kit, Rear O-Ring Housing and O-Rings | 1040 |
| **GENERIC FLAVOR TABS** | |
| Cola | 1085 |
| Cherry | 1086 |
| Orange | 1087 |
| Lemon-Lime | 1089 |
| Strawberry | 1090 |
| Banana | 1091 |
| **SERVICE TOOLS** | |
| Spanner Wrench, Flow Regulator | 151689000 |
| 3-gallon Sanitizing Tank | 281884000 |
| Spanner Wrench, Dispensing Valve | 322859000 |
| Refractometer, 0-30 Scale | 511004000 |
| Shaft Seal Assembly Puller | 322063000 |
| Alignment Tool Kit, Beater Drive Shaft Ass'y | 0726 |

# SYSTEM THEORY OF OPERATION

(see Figure 2)

A $CO_2$ cylinder delivers carbon dioxide ($CO_2$) gas to an adjustable primary $CO_2$ regulator assembly attached to the cylinder. Primary $CO_2$ regulator assembly in turn delivers $CO_2$ gas to adjustable secondary $CO_2$ regulators inside the Unit and also to two soft drink tanks. $CO_2$ is delivered from adjustable secondary $CO_2$ regulators to carbonator tank and also two product-blender tanks inside the Unit. $CO_2$ gas pressure pushes syrup out of soft drink tanks, through syrup sold-out float switches, through electrically-operated syrup solenoid valves, through adjustable syrup flow regulators, and on to product blender tanks. At the same time, plain water passes through water pressure regulator and is pumped into carbonator tank by water pump and is carbonated by $CO_2$ gas pressure also entering tank. Carbonated water is pushed by $CO_2$ gas pressure from carbonator tank, through electrically operated carbonated water solenoid valves through adjustable carbonated water flow regulators, and on to product blender tanks. Carbonated water and syrup enter tanks properly proportioned (blended) for desired BRIX of dispensed product by adjustment of syrup flow regulators. From product blender tanks, product is pushed by $CO_2$ gas into freeze cylinders. The beater in each freeze cylinder is driven by an electric motor. Scraper blades, attached to beaters, scrapes product from cylinder walls as product enters freeze cylinders and is frozen. Transparent faceplate, attached to front of each freeze cylinder, includes a self-closing dispensing valve and a spring-loaded relief valve that protects freeze cylinder from accidental over pressure. The relief valve is also used to bleed $CO_2$ gas pressure from freeze cylinder to atmosphere when filling cylinder with product. Electronic sensing on each freeze cylinder motor provides a means of adjusting viscosity (consistency) of dispensed product to suit customer preference.

# DEFROST SYSTEMS

The Unit is equipped with both manual and automatic electric defrost systems. The automatic defrost system ay be programmed into the Unit to occur up to nine different times during a day with a minimum of two hours between defrost time settings or the system may be completely turned off.

## MANUAL DEFROST SYSTEM

The Manual electric defrost system may be activated at any time by pressing ‘‘DEFROST’’ switch on front of the Unit. Refrigeration compressor will operate for a short time, then both freeze cylinders will go into defrost and defrost for approximately 15-minutes. At end of manual defrost cycle, Unit will return to normal operation. Manual defrost may be cancelled at any time by pressing ‘‘CANCEL DEFROST’’ switch.

## AUTOMATIC DEFROST SYSTEM

The automatic electric defrost system may be programmed into the Unit to occur up to nine different times a day with a minimum of two hours between defrost settings. At start of each automatic defrost cycle, refrigeration compressor will operate for a short time. No. 1 freeze cylinder only will go into defrost cycle and defrost for approximately 15-minutes, then will return to normal operation This ends automatic defrost cycle of No. 1 freeze cylinder. No. 2 freeze cylinder will defrost 30-minutes after the start of No. 1 freeze cylinder. The next automatic defrost cycle will occur according to time programmed into the Unit.

## “SLEEP” (SLEEP TIME)

“SLEEP’’ (SLEEP TIME) may be programmed into Unit to allow Unit to go into sleep time (Unit shut down, freeze cylinders beaters and refrigeration systems not operating) At start of sleep time refrigeration compressor will operate for 30-seconds to pump freon out of freeze cylinders evaporator coils, then both freeze cylinders will simultaneously go into defrost and defrost for approximately 15-minutes. At end of defrost cycle, Unit will go into sleep time.

## ‘‘WAKE UP’’ (WAKE UP TIME)

‘‘WAKE UP’’ (WAKE UP TIME) may be programmed into the Unit to allow Unit to resume normal operation at a desired time. When programmed wake up time is reached, an alarm will sound for a short duration, then Unit will resume normal operation.

**NOTE: Automatic defrost, sleep time, and wake up time may be used in any combination together or separately.**

*WATER PRESSURE REGULATOR IS FACTORY ADJUSTED TO 45–PSI AND SHOULD NOT BE READJUSTED.

**SYRUP SOLD–OUT SWITCHES ARE FACTORY ADJUSTED AND SHOULD NOT BE READJUSTED.

LINE LEGEND
$CO_2$
PLAIN WATER
CARB WATER
SYRUP
PRODUCT

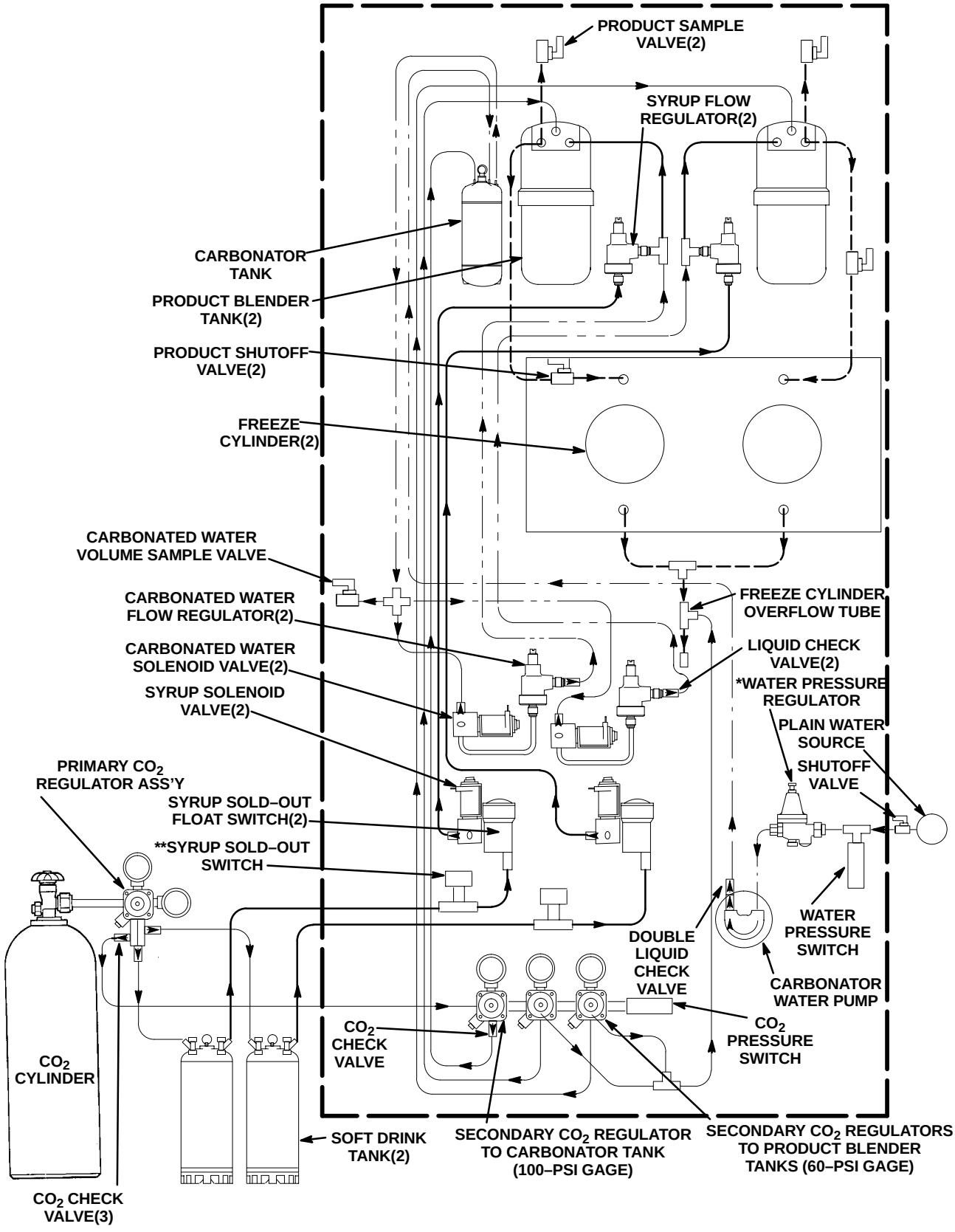


**FIGURE 2. FLOW DIAGRAM**

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# INSTALLATION

This section covers unpacking and inspection, selecting location, installing the FCB Overcounter Dispenser, preparing for operation, and operation.

## UNPACKING AND INSPECTION

**NOTE: The FCB Overcounter Dispenser was thoroughly inspected before leaving the factory and the carrier has accepted and signed for it. Any damage or irregularities should be noted at time of delivery (or not later than 15 days from date of delivery) and immediately reported to the delivering carrier. Request a written inspection report from Claims Inspector to substantiate any necessary claim. File claim with the delivering carrier, not with IMI Cornelius Inc.**

1. Unpack FCB Overcounter Dispenser and remove all shipping tape and packing materials.

2. Unpack LOOSE-SHIPPED parts. Make sure all items are present and in good condition.

**Table 3. Loose-Shipped Parts**

| Item No. | Part No. | Name | Qty. |
|---|---|---|---|
| 1 | 178025100 | Tapered Gasket, White | 5 |
| 2 | 311304000 | Tapered Gasket, Black | 1 |
| 3 | 317660000 | Cup Rest | 1 |
| 4 | 317659029 | Drip Tray | 1 |
| 5 | 319941000 | Thread Cutting Screw, Hex Hd., No. 8-32 by 3/8-in. long | 4 |
| 6 | 325723000 | Drip Tray Support | 2 |
| 7 | *2353 | Beater (item 13) | 2 |
| 8 | *325457000 | Scraper Blade (item 2) | 4 |
| 9 | 151689000 | Spanner Wrench, Flow Regulator | 1 |
| 10 | 322859000 | Spanner Wrench, Dispensing Valve | 1 |
| 11 | 325216000 | Cleaning Brush | 1 |
| 12 | 174061196 | $CO_2$ Inlet Line | 1 |
| 13 | 176272396 | Plain Water Inlet Line | 1 |
| 14 | 324252000 | Leveling Leg | 4 |
| 15 | 326002000 | Kit, Drip Tray Drain (includes items 16-20) | 1 |
| 16 | 170413000 | Drain Fitting | 1 |
| 17 | 151281000 | Lockwasher, Internal Tooth | 1 |
| 18 | 170423000 | Hex Nut, 5/8-32 | 1 |
| 19 | 140133000 | Drain Hose Clamp | 1 |
| 20 | 113500039 | Drain Hose, 1/2-in. I.D. by 60-in. long | 1 |

**NOTE:*Numbers in parentheses are in reference to items in Figure 3).**

## IDENTIFICATION OF LOOSE-SHIPPED PARTS

1. TAPERED GASKETS, WHITE (item 1) are used to seal connections when connecting syrup and $CO_2$ to Unit.

2. TAPERED GASKET, BLACK (item 2) used to connect plain water source to Unit.

3. DRIP TRAY SUPPORTS (item 6) to be installed on front of Unit and secured with THREAD CUTTING SCREWS (item 5).

4. DRIP TRAY (item 4) to be installed on drip tray supports, then CUP REST (item 3) to be installed in drip tray.

5. SPANNER WRENCH, FLOW REGULATORS (item 9) is used to adjust flow regulators inside the Unit.

6. SPANNER WRENCH, DISPENSING VALVE (item 10) is used to remove shank nuts securing dispensing valves to faceplates.

7. CLEANING BRUSH (item 11) is used to clean faceplates relief valves passages.

8. $CO_2$ INLET LINE (item 12) to be connected to secondary $CO_2$ regulator assembly inside the Unit and connection sealed with TAPERED GASKET, WHITE (item 1).

9. PLAIN WATER INLET LINE (item 13) to be connected to water pressure switch water inlet inside Unit and connection sealed with TAPERED GASKET, BLACK (item 2).

10. LEVELING LEGS (item 14) to be installed on bottom of Unit.

11. KIT, DRIP TRAY DRAIN (item 15) to be installed on drip tray as instructed.

# SELECTING LOCATION

## FCB OVERCOUNTER DISPENSER

Locate the FCB Overcounter Post-Mix Dispenser so the following requirements are satisfied:

1. Close to a filtered plain water inlet supply line with a minimum pressure of 12-psig.

### 60 HZ UNIT

**IMPORTANT: Power circuit voltage across black and white electrical wires inside electrical control box inside Unit must be in operating range of between 208 and 230 VAC, 60Hz single-phase for proper operation. If voltage is below or above this range, a .75 KVA Step Up/Step Down Transformer (P/N 326138000) is available to correct below or above voltage condition.**

2. Close to a properly grounded 208/230 VAC, 60Hz single-phase electrical circuit with a 30-amp minimum-rated disconnect switch (not provided) fused at 20-amps (“slow-blow”) or power circuit wired through an equivalent HACR circuit breaker must be available to the Unit. Use No. 10 AWG copper wire, or larger, depending upon line length, in suitable conduit or BX sheath. POWER CIRCUIT MUST BE MADE UP OF COPPER CONDUCTORS AND ALL WIRING MUST CONFORM TO NATIONAL AND LOCAL CODES. MAKE SURE UNIT IS PROPERLY GROUNDED.

### 50 HZ UNIT

**IMPORTANT: Power circuit voltage across the black and white electrical wires inside electrical control box inside Unit *must* be in operating range of between 208 and 242 VAC, 50Hz single-phase range for proper operation. If voltage is below of above this range, a means to provide voltage within operating range must be provided.**

A properly grounded 208 to 242 VAC 50Hz single-phase electrical circuit with a 30-amp minimum-rated disconnect switch (not provided) used at 20-amps (“slow-blow”) must be available to the Unit.

3. The Unit must be placed in a location which will allow shortest possible refrigeration lines route from Unit to Remote Refrigeration Assembly

**IMPORTANT: Unit operating ambient temperature MUST NOT EXCEED 100° F. Several means are available to achieve proper ambient temperature and air circulation through the Unit which are wall air intake grilles and ceiling exhaust fans, air conditioning, etc. Consult local codes.**

Circulating air, required to cool the beater drive motors, enters through louvers on back of Unit. Restricting air from entering the Unit will decrease cooling of the beater motors.

4. When placing Unit in operating location, do not allow wall or obstruction to block louvers on back of Unit. A minimum of 6-inches clearance must be allowed between back of Unit and wall or obstruction and a Minimum of 12-inches must be provided above the Unit for service and maintenance.

### REMOTE REFRIGERATION ASS'Y

The Remote Refrigeration Assembly must be located in a location which will allow shortest possible refrigeration lines route from Refrigeration Assembly to the FCB Overcounter Post-Mix Dispenser. Refer to Installation Instructions provided with the Remote Refrigeration Assembly.

## INSTALLING FCB OVERCOUNTER DISPENSER

Very carefully, tilt Unit up and install LEVELING LEGS (item 14) in four corners of the Unit base.

### INSTALLING BEATERS (item 7) AND SCRAPER BLADES (item 8)

(see Figures 3 and 4)

1. Remove four HEX NUTS and FLATWASHERS that secure each faceplate to freeze cylinders. Pull faceplates off freeze cylinders.
2. Position two SCRAPER BLADES (item 8) on BEATER (item 7) as shown in Figure 4.
3. Slide beater assembly into one of the freeze cylinders so beater slotted hooks engage DRIVE PIN on DRIVE SHAFT as shown in Figure 3.
4. Repeat procedure outlined in step 3 preceding to assemble and install beater assembly in other freeze cylinder.
5. Lubricate each faceplate O-RING (see Figure 3) with Dow-Corning (DC 111) light grade silicone to facilitate installing faceplates on freeze cylinders. Position each FACEPLATE On freeze cylinders so dispensing valves faucets face down. (MAKE SURE FEMALE END OF THE BEATER IS PLACED OVER THE FACEPLATE STAINLESS–STEEL STUD AND BUSHING BEFORE PUSHING FACEPLATE INTO POSITION ON IT'S FOUR THREADED MOUNTING STUDS) Secure each faceplate to freeze cylinders with four HEX NUTS and FLATWASHERS removed in step 1 preceding. Tighten HEX NUTS until faceplates touch all the way around on freeze cylinder flanges. CAUTION: DO NOT OVERTIGHTEN HEX NUTS.

### PLACING UNIT IN OPERATING LOCATION

1. Place Unit in operating location meeting requirements of SELECTING LOCATION.
2. After Unit has been placed in operating location, make sure front (dispensing valve side) is 1/4 to 3/8 inch higher than the back to eliminate gas pockets being trapped inside the freeze cylinder.

### INSTALLING DRIP TRAY SUPPORTS AND DRIP TRAY

(see Figure 7)

1. Install DRIP TRAY SUPPORTS (item 6) on front of Unit and secure with THREAD CUTTING SCREWS (item 5).
2. Install DRIP TRAY (item 4) on drip tray supports.

### INSTALLING DRIP TRAY DRAIN KIT (item 15)

1. Drill 5/8 inch diameter hole in bottom center of drip tray.
2. Install DRAIN FITTING (item 16) in drip tray and secure with LOCKWASHER, INTERNAL TOOTH (item 17) and HEX NUT, 5/8-32 (item 18).
3. Push DRAIN HOSE (item 20) over drip tray fitting and secure with DRAIN HOSE CLAMP (item 19).
4. Unscrew protector cap (with chain attached) from $CO_2$ cylinder valve. Before installing primary $CO_2$ regulator on $CO_2$ cylinder, open $CO_2$ cylinder valve slightly counterclockwise to blow away any dirt or dust from regulator outlet fitting, then close valve.
5. Remove shipping plug from primary $CO_2$ regulator assembly coupling nut and make sure gasket is in place inside nut. Install regulator assembly on $CO_2$ cylinder so gages can be easily read, then tighten coupling nut. DO NOT OPEN $CO_2$ CYLINDER VALVE AT THIS TIME.

**NOTE: Drip tray drain hose may be routed to a waste container, but is not recommended due to sanitation and cleaning problems. Connection of drain hose to a permanent drain is most highly recommended.**

6. Route drip tray drain hose to and connect to permanent drain.
7. Place CUP REST (item 6) in drip tray.

### PREPARING UNIT SYRUP INLET LINES FOR CONNECTION TO SOFT DRINK TANKS

(see Figure 2)

1. Remove back, sides, and top panel from Unit as instructed in SERVICE AND MAINTENANCE.
2. Route Unit syrup inlet lines, labeled No. 1 and No. 2, out through hole provided in Unit base to soft drink tanks location.
3. Install liquid disconnects on ends of Unit syrup inlet lines. DO NOT CONNECT SYRUP LINES TO TANKS AT THIS TIME.

## CONNECTING 24 VAC ELECTRICAL CIRCUIT FROM REMOTE REFRIGERATION ASS'Y TO FCB OVERCOUNTER DISPENSER

1. Route 24 VAC electrical circuit from Remote Refrigeration Assembly up through hole in Dispenser base to inside of Dispenser.
2. Connect 24 VAC power circuit electrical wires to labeled 24 V grey and red wires hanging out of Dispenser electrical control box.

## CONNECTING REMOTE REFRIGERATION ASS'Y REFRIGERATION LINES TO FCB OVERCOUNTER DISPENSER

Connect refrigeration lines, from Remote Refrigeration Assembly, to refrigeration connectors on bottom of FCB Overcounter Dispenser.

## INSTALLING PRIMARY $CO_2$ REGULATOR ASS'Y ON $CO_2$ CYLINDER

(see Figure 2)

**WARNING: To avoid personal injury and/or property damage, always secure $CO_2$ cylinder in upright position with a safety chain to prevent it from falling over. Should the valve become accidentally damaged or broken off, $CO_2$ cylinder can cause serious personal injury.**

**WARNING: $CO_2$ displaces oxygen. Strict attention *must* be observed in the prevention of $CO_2$ (carbon dioxide) gas leaks in the entire $CO_2$ and soft drink system. If a $CO_2$ gas leak is suspected, particularly in a small area, *immediately* ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentration of $CO_2$ gas will experience tremors which are followed rapidly by loss of consciousness and suffocation.**

1. Unscrew protector cap (with chain attached) from $CO_2$ cylinder valve. Before installing primary $CO_2$ regulator on $CO_2$ cylinder, open $CO_2$ cylinder valve slightly counterclockwise to blow away any dirt or dust from regulator outlet fitting, then close valve.

2. Remove shipping plug from primary $CO_2$ regulator assembly coupling nut and make sure gasket is in place inside nut. Install regulator assembly on $CO_2$ cylinder so gages can be easily read, then tighten coupling nut. DO NOT OPEN $CO_2$ CYLINDER VALVE AT THIS TIME.

## CONNECTING $CO_2$ INLET LINE (ITEM 12) TO FCB OVERCOUNTER DISPENSER

1. Route $CO_2$ INLET LINE (item 12) up through hole in bottom of Unit base to secondary $CO_2$ regulator assembly.

2. Connect $CO_2$ inlet line to elbow in secondary $CO_2$ regulator assembly inlet. Seal connector with TAPERED GASKET, WHITE (item 1).

3. Connect other end of $CO_2$ inlet line to manifold on primary $CO_2$ regulator assembly installed on $CO_2$ cylinder. Seal connection with TAPERED GASKET, WHITE (item 1).

## CONNECTING PLAIN WATER INLET LINE (ITEM 13) TO FCB OVERCOUNTER DISPENSER

(see Figure 2)

1. Route PLAIN WATER INLET LINE (item 13) up through hole in bottom of Unit base to water pressure switch connected to water pressure regulator.

2. Connect plain water inlet line to water pressure switch plain water inlet. Seal connection with TAPERED GASKET, BLACK (item 2)

**NOTE: IMI Cornelius Inc. recommends that a water shutoff valve and water filter be installed in plain water Inlet supply line (see Figure 2). A Cornelius Water Filter (P/N 313860-000) and Quick Disconnect Set (P/N 313867-000) are recommended.**

3. Before connecting plain water inlet supply line to Unit, open shutoff valve in water supply line for a period of time to flush out any metal shavings.

4. Connect plain water inlet supply line to Unit plain water inlet line.

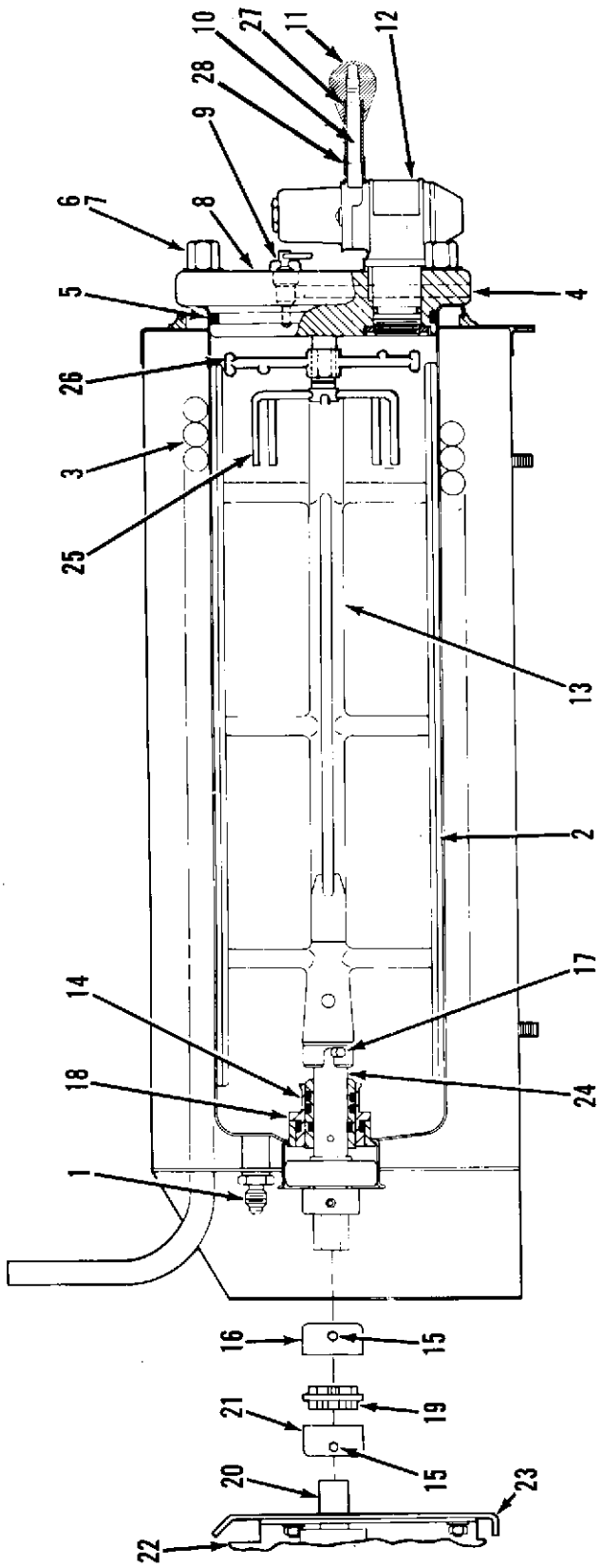



**FIGURE 3. FREEZE CYLINDER CUTAWAY VIEW**

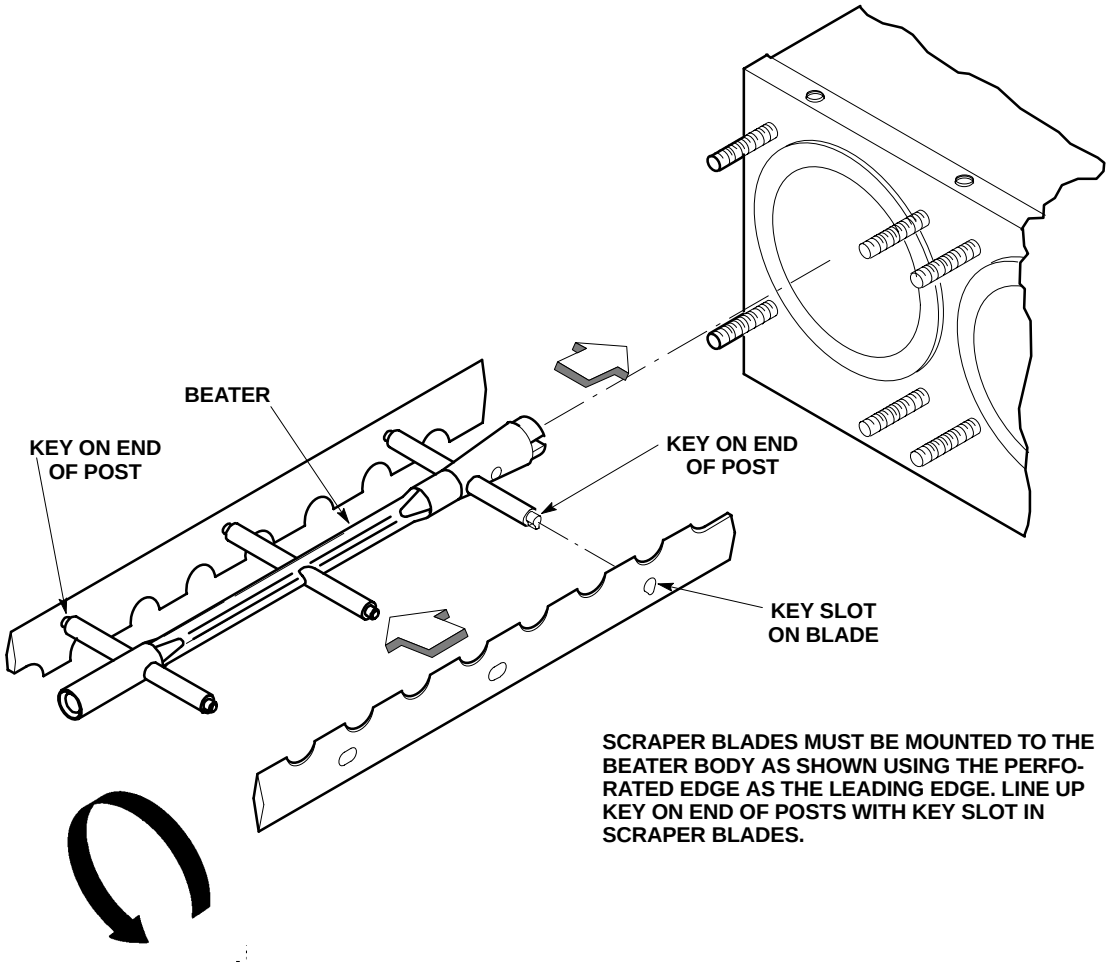

BEATER
KEY ON END OF POST
KEY ON END OF POST
KEY SLOT ON BLADE
SCRAPER BLADES MUST BE MOUNTED TO THE BEATER BODY AS SHOWN USING THE PERFO-RATED EDGE AS THE LEADING EDGE. LINE UP KEY ON END OF POSTS WITH KEY SLOT IN SCRAPER BLADES.

**FIGURE 4. BEATERS AND SCRAPER BLADES INSTALLATION**

## CONNECTING 208/230 VAC POWER CIRCUIT TO FCB OVERCOUNTER DISPENSER

(see Figure 17)

1. Route 208/230 VAC applicable 50 or 60 Hz Single-Phase electrical power circuit (meeting requirements of SELECTING LOCATION) through Unit base to electrical box inside the Unit.
2. Remove cover from electrical box.
3. Connect 208/230 VAC power circuit to electrical wires inside the electrical box, then install cover on box. DO NOT TURN ON ELECTRICAL POWER TO UNIT AT THIS TIME.

## PREPARATION FOR OPERATION

### 50 OR 60 HZ OPERATION

**IMPORTANT: Before connecting electrical power to Unit, refer to Unit nameplate and note if Unit is to be operated with 50 or 60 Hz electrical power.**

1. Remove four screws securing Unit upper control box cover for access to the master circuit board. (see Figure 6)

## TURNING ON ELECTRICAL POWER TO REMOTE REFRIGERATION ASS'Y AND FCB OVERCOUNTER DISPENSER

1. Turn on electrical power to Remote Refrigeration Assembly at disconnect switch.
2. Turn on electrical power to FCB Overcounter Dispenser at disconnect switch. Operational status of Unit is now being displayed as fault messages on control panel message display. The following fault messages will be continuously displayed at 2-second intervals until necessary operation requirements are satisfied.

   "OFF 1" (Beater Motor No. 1 not operating)

   "OFF 2" (Beater Motor No. 2 not operating)

   "$H_2O$ OUT" (No water supply to Unit)

   "$CO_2$ OUT" (No $CO_2$ gas supply to Unit)

   "SYRUP 1" (No syrup supply to Unit No. 1 syrup system)

   "SYRUP 2" (No syrup supply to Unit No. 2 syrup system)

## ADJUSTING PRIMARY AND SECONDARY $CO_2$ REGULATORS

**NOTE: to readjust $CO_2$ regulator to a lower setting, loosen adjusting screw lock nut, then turn screw to the left (counterclockwise) until pressure gage reads 5-psi lower than new setting will be. Turn adjusting screw to the right (clockwise) until gage register new setting, then tighten lock nut.**

Adjusting Primary $CO_2$ Regulator

**IMPORTANT: If bag-n-box syrup supply system will be connected to Unit instead of soft drink tanks, primary $CO_2$ regulator (see Figure 2) must be adjusted no higher than 80-psi maximum.**

1. Open $CO_2$ cylinder valve slightly to allow lines to slowly fill with gas, then open valve fully to back seat valve. Back-seating valve prevents leakage around valve shaft.
2. Adjust primary $CO_2$ regulator (see Figure 2) by turning regulator adjusting screw to the right (clockwise) until regulator gage reads 80 to 100-psig. OUT OF $CO_2$ warning light on control panel message display should have gone out.
3. Pull up on product blender tanks relief valve to purge air from tanks.

Adjusting Product Blender Tanks Secondary $CO_2$ Regulators

1. Remove Unit front lower access panel as instructed for access to product blender tanks secondary $CO_2$ regulators with 60-psi gages (see Figure 2 and 8).
2. Product blender tanks secondary $CO_2$ regulators, with 60-psi gages, have been factory set at 27 $\pm$ 2 psi for best textured dispensed products. If desired, regulators may be reset to change texture of dispensed product.

Adjusting Carbonator Secondary $CO_2$ Regulator

**IMPORTANT: Carbonator secondary $CO_2$ regulator must be adjusted 25-psi higher or more above product blender tanks secondary $CO_2$ regulators pressure settings. Carbonated water and syrup pressures must be able to overcome and vent product blender tanks head pressures while tanks are filling with carbonated water and syrup. Carbonator tank secondary $CO_2$ regulator not adjusted high enough will cause decreased flow of carbonated water into blender tanks which will increase brix of dispensed product.**

1. Carbonator secondary $CO_2$ regulator, with 100-psi gage, is factory set at 55 ± 3 psi. Carbonation of dispensed product can be varied to suit consumer preference by readjusting the $CO_2$ regulator as instructed in PRODUCT CARBONATION ADJUSTMENT.

2. Pull up on carbonator tank relief valve plastic cover to purge air from tank.

## STARTING FCB AND ADJUSTING BRIX (WATER-TO-SYRUP) ''RATIO'' OF DISPENSED PRODUCT

1. Open Plain water inlet supply line shutoff valve. Check for water leaks and tighten or repair if evident. "$H_2O$ OUT'' fault message should have gone out but "OFF 1'', "OFF 2," "SYRUP 1," and "SYRUP 2" fault message will continue to be displayed.

**IMPORTANT: Product shutoff valves, located in lines leading from product blender tanks to freeze cylinders (see Figure 2 and 8), must be closed at this time. Closing valves prevents product from filling freeze cylinders while checking BRIX of product in product blender tanks.**

2. Close product shutoff valves, located in lines leading from product blender tanks to freeze cylinders, to prevent product from entering cylinders.

**IMPORTANT: The following $CO_2$ and liquid disconnecting and connecting procedure for soft drink tank replacement or filling soft drink tank in place must be performed in order as follows:**

<u>To disconnect soft drink tank from Unit syrup system.</u>

A. Disconnect liquid disconnect from soft drink tank. NOTE - Disconnecting liquid quick disconnect from soft drink tank first prevents syrup from backflowing through Unit syrup flow regulator which may alter regulator adjustment.

B. Second, disconnect $CO_2$ quick disconnect from soft drink tank.

<u>To connect soft drink tank into Unit syrup system.</u>

C. First, connect $CO_2$ quick disconnect to soft drink tank to pressurize tank.

D. Second, connect liquid quick disconnect to soft drink tank.

3. Pressurize soft drink tanks containing syrup, then connect tanks into Unit syrup systems. "OFF 1'', "OFF 2", "SYRUP 1'', and "SYRUP 2" fault messages will continue to be displayed.

4. The following steps a through l are instructions for adjusting Brix (Water-to-Syrup) "Ratio" (mixture) of dispensed product on one system.

**NOTE: Unit control panel is equipped with a hidden "SECURITY SWITCH" located between "FILL 1" and "ERROR RESET" control switches (see Figure 5). Pressing in and holding ''SECURITY SWITCH" for 3-seconds deactivates control switches preventing tampering with Unit normal operation. To reactivate control switches, press in and hold "SECURITY SWITCH" for 3-seconds.**

A. Press "FILL 1 '' switch to fill No. 1 syrup system sold-out float. "SYRUP 1'' fault message will go out and "FILL 1'' fault message will come on. "OFF 1'', and "FILL 1'' fault messages will continue to be displayed.

B. Press "AUTO BLEND 1" switch to fill No. 1 product blender tank with product. "FILL 1" fault message will go out when "AUTO BLEND 1" switch is pressed. When product blender tank s full, press "FILL 1" switch to prevent more product from entering tank. "OFF 1", and "OFF 2", and "SYRUP 2'' fault messages will continue to be displayed.

C. Open No. 1 product blender tank product sample valve (see Figures 2 and 8) and take sample (approximately 6-ounces) of product in cup.

**NOTE: Temperature compensated hand-type refractometers (P/N 511004000) are available from The Cornelius Company.**

D. Check product BRIX with a temperature compensated hand-type refractometer. BRIX should read 14 ± 3. If BRIX is not within tolerance, adjust white syrup flow regulator for No. 1 syrup system as follows:

E. Loosen jamb nut on syrup flow regulator. Turn regulator adjusting screw to the left (counterclockwise) no more than 1/8 turn at a time to reduce syrup flow rate or turn screw to the right (clockwise) no more than 1/8 turn to increase flow rate. Tighten jamb nut on syrup flow regulator, then lightly tap, regulator to register adjustment.

F. Place container under No. 1 product sample valve. Open valve and purge product out of product blender tank, line, and valve, then close valve. ‘‘OFF 1’’, ‘‘OFF 2’’, and ‘‘SYRUP 2’’ will continue to be displayed.

G. Press ‘‘AUTO BLEND 1’’ switch to run new batch of product into product blender tank. When Product blender tank is full, press ‘‘FILL 1’’ switch to prevent more product from entering product blender tank. ‘‘OFF 1’’, ‘‘OFF 2’’, and ‘‘SYRUP 2’’ fault messages will continue to be displayed.

H. Repeat steps c and d preceding to check product sample for BRIX

I. Repeat steps f through h preceding until proper BRIX adjustment is achieved.

J. Repeat steps a through i preceding to adjust BRIX of dispensed product on No. 2 system. After completing BRIX on No. 2 system, ‘‘OFF 1’’ and ‘‘OFF 2’’ fault messages should continue to be displayed.

**NOTE: Syrup systems may be sanitized at this time as instructed in SECTION IV SERVICE AND MAINTENANCE.**

K. Open product shutoff valves located in lines leading from product blender tanks to freeze cylinders.

L. Press ‘‘AUTO BLEND 1’’ and ‘‘AUTO BLEND 2’’ switches to begin filling freeze cylinders. Open freeze cylinders faceplates relief valves to bleed air from cylinders while filling with product, then close valves. Do not relieve freeze cylinder pressure too fast or product will foam excessively in cylinder and lose carbonation.

## ADJUSTING BEATER MOTOR CURRENT (EITHER SIDE)

Adjusting beater motor current (either side) procedure is very important and must be performed as instructed. Be sure you fully understand the instructions before performing the current adjustments or doing any preventative maintenance current readings check.

**Any current adjustments or preventative maintenance current readings check on the beater motor current (either side) *must* be performed with both freeze cylinders fully defrosted. A partially defrosted freeze cylinder will cause false current readings to be displayed on the message display. Adjust beater motor current (either side) as follows**

1. Place No. 4 ‘‘BEATER MOTOR CURRENT READOUT’’ switch on DIP SWITCH assembly on master circuit board (see FIGURE 6) in ‘‘ON position. Both freeze cylinders beater motors will start and operate and beaters motors current ratings will be displayed on message display.

2. Display should be adjusted to read
A150 B150±2 by adjusting MOTOR CURRENT ADJUSTMENTS located on No. 1 and No. 2 relay circuit boards (see FIGURE 6). These figures will fluctuate slightly with variations in line voltage and motor loads.

3. After completion of adjusting beater motor current A150 B150 ± 2, make sure No. 5 ‘‘MOTOR CURRENT SELF-CALIBRATION’’ switch on DIP SWITCH assembly on master circuit board (see FIGURE 6) is in ‘‘OFF’’ position. No. 5 switch in ‘‘OFF’’ position allows the ‘‘MOTOR CURRENT SELF-CALIBRATION’’ electronics to automatically self calibrate the beater motors currents at completion of each defrost cycle.

**CAUTION: IF NO. 4 ‘‘BEATER MOTOR CURRENT READOUT’’ SWITCH ON DIP SWITCH assembly is placed in ‘‘ON’’ position and beater motor current readings were A155 B145±2 and switch was then placed back in ‘‘OFF’’ position without readjusting to A150 B150±2, beater motor current has just been reset at A155 B145. Operating the FCB Dispenser at these current readings may have serious effects on its operation.**

ANY TIME THE NO. 4 “BEATER MOTOR CURRENT READOUT’’ SWITCH ON DIP SWITCH ASSEMBLY IS PLACED IN “ON’’ POSITION, THE BEATER MOTOR CURRENT READINGS MUST BE READJUSTED TO A150 B150 ± 2 AS INSTRUCTED, THEN SWITCH MUST BE PLACED BACK IN THE “OFF’’ POSITION.

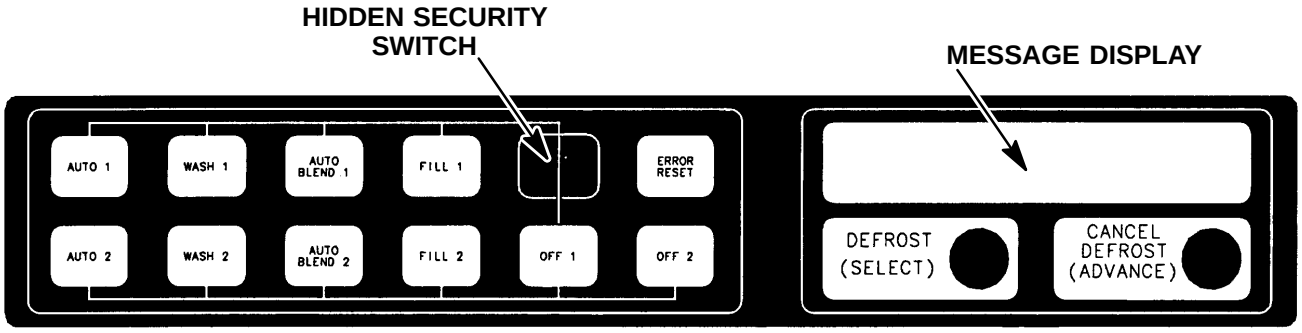



**FIGURE 5. CONTROL PANEL**

## ADJUSTMENTS AND PROGRAMMING MAIN MENU SELECTIONS COMPONENTS “DIAGNOSE” (DIAGNOSTIC MODE), AND“ TOTALS (DISPLAYED CYCLES AND HOURS TOTALS) INTO UNIT

**NOTE: The Unit control panel switches are as shown in FIGURE 5.**

The following instructions outline the adjustments, programming, and programming components diagnose into the Unit.

**NOTE: Plain water, $CO_2$ and syrup supplies to Unit must be satisfied to turn off “$H_2O$ OUT”, “$CO_2$ OUT”, “SYRUP 1”, and “SYRUP 2” fault messages on message display before adjustments and programming procedures can be performed on the Unit.**

### PROGRAMMING MAIN MENU SELECTION ONTO MESSAGE DISPLAY

The MAIN MENU SELECTIONS (see Table 4) may be brought up on the message display as follows:

1. Press “AUTO 1’’, “WASH 1”, and “BLEND 1” control switches (see FIGURE 5) at the same time and hold them pressed for a minimum of 1/2 second to bring up MAIN MENU SELECTIONS on message display. The word “CLOCK’’ will appear on display. You are now in the MAIN MENU SELECTIONS as shown in Table 4. To advance through the MENU SELECTIONS, repeatedly press the “CANCEL DEFROST’’ (ADVANCE) switch. Once you reach the desired selection, press the “DEFROST’’ (SELECT) switch to lock in on the selection.

**NOTE: to exit MENU SELECTION and go back to MAIN MENU SELECTIONS, press “ERROR RESET” (RESET) switch. Press “ERROR RESET (RESET) switch again to exit from MAIN MENU SELECTIONS.**

### SETTING CLOCK (TIME OF DAY)

**NOTE: The CLOCK (TIME OF DAY) must be programmed into Unit before “DEFROST’’ (AUTOMATIC), “SLEEP’’ (SLEEP TIME), and “WAKE UP” (WAKE UP TIME) can be programmed into the Unit.**

Program “CLOCK’’ (TIME OF DAY) into Unit as follows:

1. Refer to PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY and bring up “CLOCK’’ on display. Press “DEFROST’’ (SELECT) switch to lock in on selection.

2. Press “CANCEL DEFROST” (ADVANCE) switch to bring up flashing hour number on display.

3. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance hours on display to desired hour. Press ‘‘DEFROST’’ (SELECT) switch to lock in hour on display.

4. After hour (time of day) has been locked in on message display, minute numbers will be flashing on display. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance minute numbers to desired minutes (time of day). Press ‘‘DEFROST’’ (SELECT) switch to lock in minute (time of day) on display.

5. Press ‘‘ERROR RESET’’ switch two times to exit from MENU SELECTION.

6. Press ‘‘CANCEL DEFROST’’(ADVANCE) switch to bring up flashing hour number on display.

**Table 4. Main Menu Selections**

| MENU SELECTIONS | MESSAGE DISPLAY (EXAMPLE READOUTS) |
|---|---|
| “CLOCK” (TIME OF DAY) see note below | C _ 1 2 - 0 0 A |
| “DEFROST” (AUTOMATIC) | 3 D 1 0 - 0 0 A |
| “SLEEP” (SLEEP TIME) | S 1 2 - 3 0 A _ |
| “WAKE UP” (WAKE UP TIME) | W _ 0 7 - 1 5 A |
| “VIS SET” (PRODUCT VISCOSITY SETTING) | 1 2 _ _ _ _ 1 0 |
| “VIS READ” (ACTUAL VISCOSITY READOUT) | 1 6 _ _ _ _ 1 1 |
| “SENSORS (TEMPERATURES READOUT) | 7 5 * 7 5 * 7 5 |
| “VOLTAGE” (DISPLAYED VOLTAGE READOUT) | V R M S * 2 3 0 |
| “DIAGNOSE” (DIAGNOSTIC MODE) | See Programming Components Diagnose into Unit. |
| “TOTALS” | See Table 7 and programming “TOTALS” (DISPLAYED CYCLES AND HOURS TOTALS) into unit. |
| “MOTORS” (BEATER MOTOR MANUFACTURER) | See Table 6 |
| “REF TYPE” (REFRIGERANT TYPE) | See PROGRAMMING PROPER REFRIGERANT TYPE INTO UNIT ELECTRONICS |

**NOTE: the “CLOCK” (TIME OF DAY) must be programmed into the Unit before “DEFROST” (AUTOMATIC) “SLEEP” (SLEEP TIME), and “WAKE UP” (WAKE UP TIME) will function.**

## PROGRAMMING ‘‘DEFROST’’ (AUTOMATIC) SETTINGS INTO UNIT

The automatic defrost system may be programmed into the Unit to occur up to nine different times during a day with a minimum of two hours between defrost time settings. Program automatic defrost time settings into the Unit as follows:

1. Refer to PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY and bring up ‘‘DEFROST’’ on message display. Press ‘‘DEFROST’’ (SELECT) switch to lock in on selection.

2. Press ‘‘CANCEL DEFROST’’(ADVANCE) switch to bring up flashing hour number on display.

3. Press ‘‘CANCEL DEFROST’’(ADVANCE) switch to advance hours on display to desired hour. Press ‘‘DEFROST’’(SELECT) switch to lock in hour on display.

4. After hour (time of day) has been locked in on message display, minute numbers will be flashing on display. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance minute numbers to desired minutes (time of day). Press ‘‘DEFROST’’ (SELECT) switch to lock in minute (time of day) on display.

5. Press ‘‘DEFROST’’ (SELECT) switch, then repeat steps 2, 3, and 4 to program in next defrost time setting. MAKE SURE A MINIMUM OF TWO HOURS IS MAINTAINED BETWEEN DEFROST TIME SETTINGS. IF A TIME SETTING OF LESS THAN TWO HOURS IS PROGRAMMED INTO THE UNIT, A MOMENTARY ‘‘ERROR’’ MESSAGE WILL APPEAR ON THE MESSAGE DISPLAY WHEN OPERATOR TRIES TO EXIT ‘‘DEFROST’’. THE PROGRAM WILL NOT ALLOW THE OPERATOR TO EXIT THE DEFROST SETTING UNTIL THE LESS THEN TWO HOUR DEFROST TIME IS CORRECTED. THE OPERATOR MUST PRESS ‘‘CANCEL DEFROST’’ (ADVANCE) SWITCH, THEN REPEAT STEPS 2, 3, and 4 TO PROGRAM CORRECTED DEFROST TIME INTO UNIT.

6. Repeat step 5 as many times as necessary to program desired number of defrost time settings into the Unit.

7. Press ‘‘ERROR RESET’’ switch two times to exit from MENU SELECTIONS.

## PROGRAMMING ‘‘SLEEP” (SLEEP TIME) INTO UNIT

‘‘SLEEP’’ (SLEEP TIME) may be programmed into Unit to occur any time of the day after Unit automatic defrost cycle has occurred. Unit will shut down (go into sleep time) and will not wake up (return to normal operation) until programmed ‘‘WAKE UP’’ (WAKE UP TIME) has occurred. Program ‘‘SLEEP’’ (SLEEP TIME) into Unit as follows:

1. Refer to PROGRAMMING MENU SELECTIONS ONTO MESSAGE DISPLAY and bring up ‘‘SLEEP’’ on message display. Press ‘‘DEFROST’’ (SELECT) switch to lock in on selection.

2. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to bring up flashing hour number on display.

3. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance hours on display to desired hour. Press ‘‘DEFROST’’ (SELECT) switch to lock in hour on display.

4. After hour (time of day) has been locked in on message display, minute numbers will be flashing on display. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance minute numbers to desired minutes (time of day). Press ‘‘DEFROST’’ (SELECT) switch to lock in minutes (time of day) on display.

5. Press ‘‘ERROR RESET’’ switch two times to exit from MENU SELECTIONS.

## PROGRAMMING ‘‘WAKE UP” (WAKE UP TIME) INTO UNIT

(WAKE UP TIME) may be programmed into Unit to occur any time of the day to wake Unit up (return to normal operation) after ‘‘sleep time’’ has occurred. Program ‘‘WAKE UP’’ into Unit as follows:

1. Refer to PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY and bring up ‘‘WAKE UP’’ on message display. Press ‘‘DEFROST’’ (SELECT) switch to lock in on selection.

2. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to bring up flashing hour number on display.

3. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance hours on display to desired hour. Press ‘‘DEFROST’’ (SELECT) switch to lock in hour on display.

4. After hour (time of day) has been locked in on message display, minute numbers will be flashing on display. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance minute numbers to desired minutes (time of day). Press ‘‘DEFROST’’ (SELECT) switch to lock in minutes (time of day) on display.

5. Press ‘‘ERROR RESET’’ switch two times to exit from MENU SELECTIONS.

## PROGRAMMING POINT OF SALE DISPLAY MESSAGE

(see Figure 6 and Table 7)

**Note: Point of sales display messages may be turned off by placing No. 1 DIP SWITCH on master circuit board in “OFF” position and No. 2 DIP SWITCH in “ON” position (see Figure 6 and Table 5 and Table 7).**

Three point of sales display messages are available and the desired one may be programmed in to appear on the message display by placing No. 1 and No. 2 switches (see Figure 6, Table 5, and Table 7) on the DIP SWITCH ASSEMBLY in the appropriate positions.

## ADJUSTING “VIS SET” (PRODUCT VISCOSITY) OF DISPENSED PRODUCT

Adjusting “VIS SET” (PRODUCT VISCOSITY) determines what product consistency of the dispensed product will be present in each freeze cylinder. Adjust “VIS SET”(PRODUCT VISCOSITY) of the dispensed product as follows:

1. Refer to PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY and bring up “VIS SET” on message display.
2. Press “DEFROST” (SELECT) switch to bring up numbers on message display.

**NOTE: The direction of arrows ( ≪ ≫ ) on message display indicates which set of numbers belongs to which freeze cylinder. A No. 4 setting indicates the thinnest product consistency of dispensed product and a No. 12 setting indicates the thickest consistency of product dispensed.**

3. Press “CANCEL DEFROST” (ADVANCE) switch. The left-side freeze cylinder viscosity number will be flashing on message display.
4. Press “CANCEL DEFROST” (ADVANCE) switch to advance viscosity number to desired setting. Press “DEFROST” (SELECT) switch to lock in viscosity setting. The right-side freeze cylinder viscosity number will now be flashing.
5. Press “CANCEL DEFROST” (ADVANCE) switch to advance viscosity number to desired setting. Press “DEFROST” (SELECT) switch to lock in viscosity setting.
6. Press “ERROR RESET” switch two times to exit from MENU SELECTIONS.

## “VIS READ” (ACTUAL VISCOSITY READOUT) OF PRODUCT IN FREEZE CYLINDERS

“VIS READ” (ACTUAL VISCOSITY READOUT) may be brought up on message display to actually read the viscosity (product consistency) of the product in the freeze cylinders while the Unit is in operation. Bring “VIS READ” up on message display as follows:

1. Refer to PROGRAMMING MENU SELECTIONS ON MESSAGE DISPLAY and bring up “VIS READ” of product in freeze cylinders.
2. Press “DEFROST” (SELECT) switch to bring up actual viscosity readout of product in each freeze cylinder.

   Left Reading–Refrigeration Coils Inlet No. 1

   Middle Reading–Refrigeration Coils Inlet No. 2

   Right Reading–Common Outlet
3. Press “ERROR RESET” switch two times to exit from MENU SELECTIONS.

## DISPLAYED EVAPORATOR REFRIGERATION COILS INLETS AND COMMON OUTLET SENSORS TEMPERATURES.

Evaporator refrigeration coils inlet and common outlet temperature readings in degrees Fahrenheit may be displayed on message displays as follows:

1. Refer to PROGRAMMING MENU SELECTIONS ON MESSAGE DISPLAY and bring up “SENSORS” (TEMPERATURES READOUT)on message display.

2. Press “DEFROST’’ (SELECT) switch to bring up evaporator refrigeration coils inlet and common outlet temperature readings in degrees Fahrenheit.

3. Press ‘ERROR RESET’’ switch two times to exit from MENU SELECTIONS.

## “VOLTAGE” (DISPLAYED VOLTAGE READOUT)

Displayed voltage readout may be displayed on message display as follows:

1. Refer to PROGRAMMING MENU SELECTIONS ON MESSAGE DISPLAY and bring up “VOLTAGE’’ (DISPLAYED VOLTAGE READOUT) on message display.

2. Press “DEFROST’’ (SELECT) switch to bring up voltage readout on message display.

3. Press “ERROR RESET’’ switch two times to exit from MENU SELECTIONS.

## PROGRAMMING COMPONENTS “DIAGNOSE” (DIAGNOSTIC MODE) INTO UNIT

“DIAGNOSE’’ (DIAGNOSTIC MODE) may be programmed into the Unit to check certain components for operation. Program “DIAGNOSE’’ into Unit and check components for proper operation as follows:

1. Refer to PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY and bring up the word “CLOCK’’ on display.

2. Press “CANCEL DEFROST’’ (ADVANCE) switch to bring up “DIAGNOSE’’ menu on message display. Press “DEFROST’’ (SELECT) switch to lock in place. The word “MOTOR 1’’ will appear on message display.

3. Press “DEFROST’’ (SELECT) switch. No. 1 beater motor will start and operate while switch is pressed.

4. Press “CANCEL DEFROST’’ (ADVANCE) switch to advance and bring up the word “MOTOR 2’’ on message display.

5. Press “DEFROST’’ (SELECT) switch. No. 2 beater motor will start and operate while switch is pressed.

6. Press “CANCEL DEFROST’’ (ADVANCE) switch to advance and bring up “DEFROST 1’’ on message display.

7. Press “DEFROST’’ (SELECT) switch. No. 1 defrost relay will click when switch is pressed.

8. Press “CANCEL DEFROST’’ (ADVANCE) switch to advance and bring up “DEFROST 2’’ on message display.

9. Press “DEFROST’’ (SELECT) switch. No. 2 defrost relay will click when switch is pressed.

10. Press “CANCEL DEFROST’’ (ADVANCE) switch to advance and bring up “SYRUP 1’’ on message display.

11. Press “DEFROST’’ (SELECT) switch. No. 1 syrup solenoid relay will click when switch is pressed.

12. Press “CANCEL DEFROST’’ (ADVANCE) switch to advance and bring up “SYRUP 2’’ on message display.

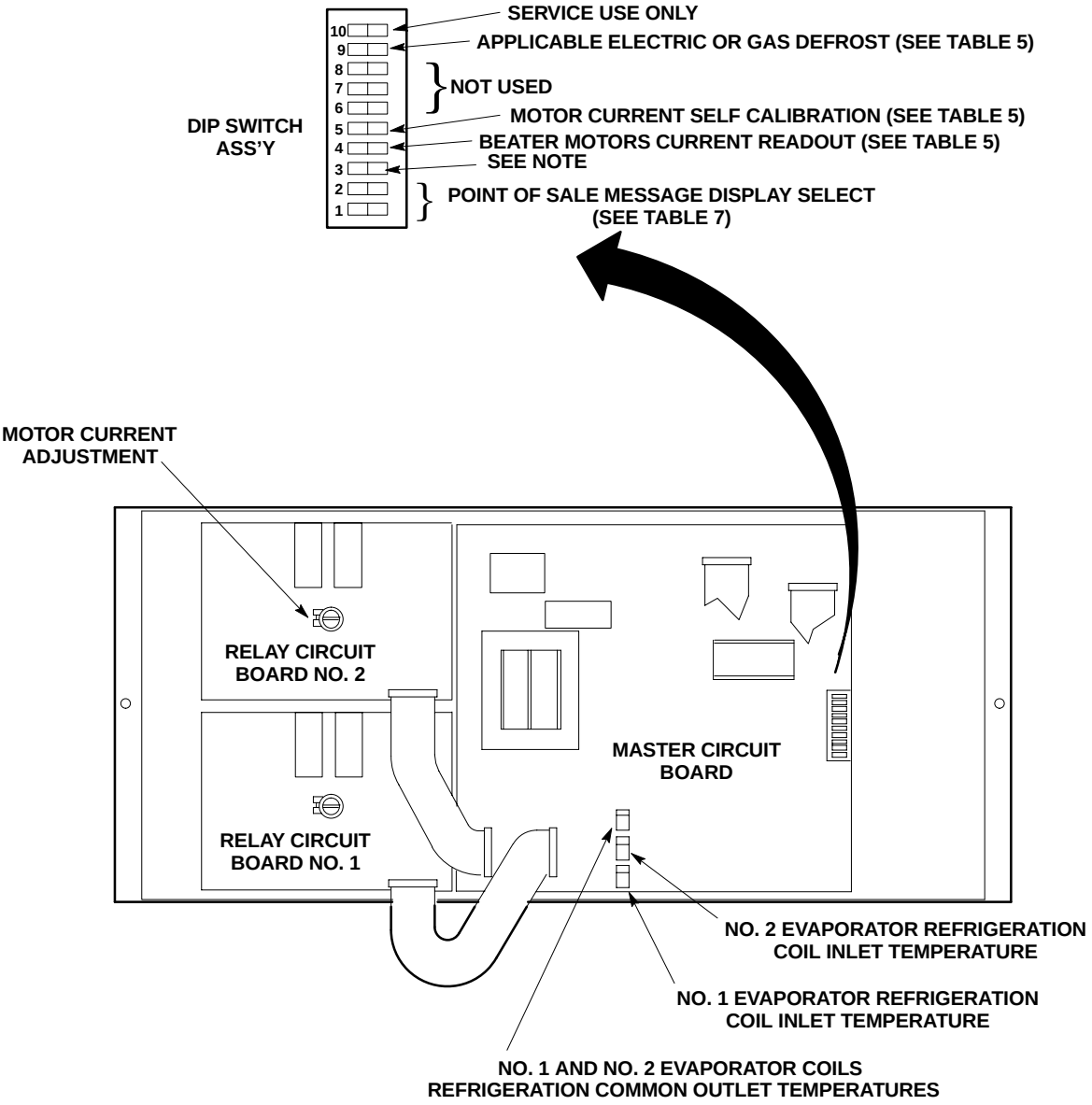
13. Press “DEFROST’’ (SELECT) switch. No.2 syrup solenoid relay will click when switch is pressed.

14. Press “CANCEL DEFROST’’ (ADVANCE) switch to advance and bring up “WATER 1’’ message display.

15. Press “DEFROST’’ (SELECT) switch. No. 1 carbonated water solenoid relay will click when switch is pressed.

16. Press “CANCEL DEFROST’’ (ADVANCE) switch to advance and bring up “WATER 2’’ on message display.

17. Press ‘’DEFROST’’ (SELECT) switch. No. 2 carbonated water solenoid relay will click when switch is pressed.




**Note: Switch No. 3 must be in "ON" position for standard Units with pulse expansion valves. Switch No. 3 must be in "OFF position for Units with mechanical expansion valves.**

**FIGURE 6. MASTER AND RELAY CIRCUIT BOARDS**

| Table 5. DIP SWITCH FUNCTIONS | | |
|---|---|---|
| **SWITCH NO.** | **FUNCTION** | |
| 1 | POINT OF SALE MESSAGE SELECT | See TABLE 7 |
| 2 | POINT OF SALE MESSAGE SELECT | See TABLE 7 |
| 3 | | See **Note** |
| 4 | BEATER MOTOR CURRENT READOUT | ON- Display current readout.<br>OFF- No displayed current readout. |
| 5 | MOTOR CURRENT SELF CALIBRATION | ON- Disabled.<br>OFF- Operating. |
| 6 | NOT USED | |
| 7 | NOT USED | |
| 8 | NOT USED | |
| 9 | DEFROST | ON- Hot gas.<br>OFF- Electric. |
| 10 | SERVICE USE | |

**Note: Switch No. 3 must be in "OFF" position for standard Units with pulse expansion valves.**
**Switch No. 3 must be in "ON" position for older Units with mechanical expansion valves.**

| Table 6. BEATER MOTOR SELECT | | | |
|---|---|---|---|
| **DISPLAYED** | **MODEL** | **HZ** | **MOTOR DESCRIPTION** |
| KLBER_60 | Klauber | 60 | Over/under gear box with a GE wide range voltage motor. |
| FASV3+60 | Fasco/VW | 60 | Over/under gear box with a Fasco wide range-voltage motor. |
| FASCWR 60 | Fasco/VW | 60 | Standard gear box using a Fasco wide-range voltage motor. |
| VW/GE 60 | Fasco/VW | 60 | Standard gear box with a GE 219/242 volt motor. |
| EMRSN 60 | Emerson | 60 | Over/under gear box with an Emerson wide-range motor. |
| BODINE 60 | Bodine | 60 | Special wide-range motor. |
| KLBER_50 | Klauber | 50 | Over/under gear box with a GE wide-range voltage motor. |
| FASV3+50 | Fasco/VW | 50 | Over/under gear box with a Fasco wide-range voltage motor. |
| FASCWR 50 | Fasco/VW | 50 | Standard gear box using a Fasco wide-range voltage motor. |
| VW/GE 50 | Fasco/VW | 50 | Standard gear box with a GE 219/242 volt motor. |
| EMRSN 50 | Emerson | 50 | Over/under gear box with an Emerson wide-range motor. |

| Table 7. POINT OF SALE DISPLAY MESSAGES | | |
|---|---|---|
| **DIP SWITCH NO. 1** | **DIP SWITCH NO. 2** | ***MESSAGE** |
| OFF | OFF | "ENJOY A FROZEN BEVERAGE" |
| OFF | ON | NOT USED - BLANK |
| ON | OFF | "HAVE A NICE DAY" |
| ON | ON | "DISFRUTE UNA BEBIDA CONGELADA CARBONATADA" |

*For special messages, contact you local sales representative

| Table 8. “TOTALS” (DISPLAYED CYCLES AND HOURS TOTALS) MENU | |
|---|---|
| **TOTALS MENU COMMANDS** | **DESCRIPTION** |
| COMP HRS | COMPRESSOR RUN HOURS |
| COMP CYC | COMPRESSOR CYCLES X100 |
| DFSTYC1 | DEFROST SIDE 1 CYCLES |
| DFSTYC2 | DEFROST SIDE 2 CYCLES |
| BLDRCYC1 | BLENDER SIDE 1 CYCLES X100 |
| BLDRCYC2 | BLENDER SIDE 2 CYCLES X100 |
| SOLDOUT 1 | SOLDOUT SYRUP SIDE 1 |
| SOLDOUT 2 | SOLDOUT SYRUP SIDE 2 |
| BMTRHRS1 | BEATER MOTOR 1 HOURS |
| BMTRHRS2 | BEATER MOTOR 2 HOURS |
| PWR ON | POWER ON HOURS |
| AUTO ON 1 | AUTO SIDE 1 HOURS |
| AUTO ON 2 | AUTO SIDE 2 HOURS |
| ERR HRS 1 | ERROR SIDE 1 HOURS |
| ERR HRS 2 | ERROR SIDE 2 HOURS |
| SLEEP HRS | SLEEP MODE HOURS |
| SYR MIN 1 (see note) | SYRUP MINUTES (SIDE 1) |
| SYR MIN 2 (see note) | SYRUP MINUTES (SIDE 2) |

**NOTE: Displaying “SYR MIN 1” or “SYR MIN 2” on message display will indicate time in minutes syrup actually has been dispensed. Refer to table and formula (next page) to calculate how much syrup has been dispensed.**

| BRIX | “A” |
|---|---|
| 11.0 | 0.1358 |
| 11.5 | 0.1420 |
| 12.0 | 0.1481 |
| 12.5 | 0.1543 |
| 13.0 | 0.1605 |
| 13.5 | 0.1667 |
| 14.0 | 0.1728 |
| 14.5 | 0.1790 |
| 15.0 | 0.1852 |
| 15.5 | 0.1914 |
| 16.0 | 0.1975 |

GALLONS = “A” x SYRUP MINUTES

**Note: “A” numbers are based upon a 4.4 to 1 water to syrup “ratio”.**

Using the table to the left, choose the “A” number that corresponds to your BRIX setting. Multiply the “A” number by the syrup minutes reading to obtain the amount (gallons) of syrup used.

18. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance and bring up ‘‘RF SOL 1’’ on message display.
19. Press ‘‘DEFROST’’ (SELECT) switch. Refrigeration relay clicks when switch is pressed
20. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance and bring up ‘‘RF SOL 2’’ on message display.
21. Press ‘‘DEFROST’’ (SELECT) switch. No. 2 refrigeration solenoid clicks when switch is pressed.
22. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance and bring up ‘‘COMPRESS’’ on Message display.

23. Press ‘‘DEFROST’’ (SELECT) switch. Compressor and condenser fan motor will start and operate while switch is pressed.

24. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance and bring up ‘‘$H_2O$ PUMP’’ on message display.

25. Press ‘‘DEFROST’’ (SELECT) switch. Carbonator water pump relay on master circuit board clicks when switch is pressed.

26. Press ‘‘ERROR RESET’’ switch two times to exit from MENU SELECTIONS.

## DISPLAYING ‘‘TOTALS’’ (DISPLAYED CYCLES AND HOURS TOTALS) ONTO MESSAGE DISPLAY

(see Tables 4 and 8)

‘‘TOTALS’’ (DISPLAYED CYCLES AND HOURS TOTALS) may be displayed on message display as follows:

1. Refer to PROGRAMMING MAIN MENU SELECTION ONTO MESSAGE DISPLAY and bring up the word ‘‘CLOCK’’ on message display.

2. Repeatedly press and release ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance through main menu until ‘‘TOTALS’’ menu appears on message display. Press ‘‘DEFROST’’ (SELECT) switch to lock ‘‘TOTALS’’ menu in place. The word ‘‘COMP HRS’’ will appear on message display.

3. Press and hold ‘‘DEFROST’’ (SELECT) switch. Compressor run hours will appear on message display.

4. Press ‘‘CANCEL DEFROST’’ (ADVANCE) switch to advance and bring up ‘‘COMP CYC’’ on message display.

5. Press and hold ‘‘DEFROST’’ (SELECT) switch. Compressor cycles x 100 will appear on message display.

6. Use CANCEL DEFROST (ADVANCE) switch to advance through remaining ‘‘TOTALS’’ (DISPLAYED CYCLES AND HOURS TOTAL MENU) see Table 8. Press ‘‘DEFROST’’ (SELECT) switch to obtain message display readings of the individual menu selections.

7. Press ‘‘ERROR RESET’’ switch two times to exit from MENU SELECTIONS.

## PROGRAMMING FREEZE CYLINDERS BEATER “MOTORS” INTO UNIT ELECTRONICS

**IMPORTANT: Note in Table 6 the number of freeze cylinders beater motors Manufacturer’s that are listed. Your Unit was manufactured and equipped with motors from one of these Manufacturer’s. A replacement freeze cylinder beater motor is also manufactured by one of these Manufacturer’s listed. DURING NEW UNIT INSTALLATION, OR WHEN REPLACING ONE OF THE BEATER MOTORS, NOTE THE MANUFACTURER’S NAME ON THE MOTOR(S). THE BEATER MOTOR(S) MANUFACTURER’S NAME(S) MUST BE PROGRAMMED INTO THE UNIT WHICH WILL MATCH THE MOTOR(S) TO THE UNIT ELECTRONICS. Proceed as follows to program the beater motors into the Unit electronics.**

1. Refer to “PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY” and bring up “MOTORS” on the message display. Press “DEFROST” (SELECT) switch to lock in on the selection. “MOT_1 MFG 1” (represents No. 1 freeze cylinder beater motor) will appear on the message display.

2. Press “DEFROST” (SELECT) switch again. A motor Manufacturer’s name (see Table 6) will appear on the message display and will be non-blinking.

3. Press “CANCEL DEFROST” (ADVANCE) switch. The motor Manufacturer’s name will start blinking.

4. Press the “CANCEL DEFROST” (ADVANCE) switch again which will change to another blinking Manufacturer’s name.

5. Keep pressing and releasing the “CANCEL DEFROST’ (ADVANCE) switch until the applicable blinking Manufacturer’s name appears on the message display. This indicates Manufacturer’s name of the No. 1 freeze cylinder beater motor (new Unit installation) or the new installed replacement motor.

6. After applicable beater motor Manufacturer’s name has been selected, press “DEFROST” (SELECT) switch which will match the beater motor to the Unit electronics. The motor Manufacturer’s name will no longer be blinking.

7. Press “DEFROST” (SELECT) switch to return to “MOT_MFG1”.

8. Press “CANCEL DEFROST” (ADVANCE) switch to go from “MOT_MFG1” to “MOT_MFG2” (represents No. 2 freeze cylinder beater motor) which will appear on the message display.

9. Repeat steps 2 through 6 to program in the correct beater motor Manufacturer’s name for No. 2 freeze cylinder.

### PROGRAMMING PROPER REFRIGERANT TYPE INTO UNIT ELECTRONICS

The Dispenser electronics *must* be programmed for the proper refrigeration pulse rate according to the type of refrigerant gas that has been installed in the refrigeration system. Note Dispenser serial plate for the type of refrigerant gas that has been installed, then proceed as follows to program the Dispenser.

1. Refer to PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY and bring up “REF TYPE” (REFRIGERANT TYPE) on the message display. Press “DEFROST (SELECT) switch to lock in on the selection. The sub menu of refrigerant types that may be brought up on the MESSAGE DISPLAY from “REF TYPE” (REFRIGERANT TYPE) are as follows:

   A. “R404A2HP” (V3+ Dispenser with 2 H.P. Copeland Compressor and R-404A Refrigerant).

   B. “R404A3HP” (V3+ Dispenser with 3 H.P. Copeland Compressor and R-404A refrigerant).

   C. “R502” (V3 and V3+ Dispensers using Bristol or Tecumseh Compressor and R502 refrigerant).

   D. “R402B5OH” (V3 and V3+ Dispensers using a Bristol Compressor and R-402B refrigerant).

2. Refer to Dispenser serial plate to identify the type of refrigerant gas installed in the refrigeration system.

3. Press “CANCEL DEFROST” (ADVANCE) switch as many times as necessary to bring up applicable refrigerant type from sub menu of “REF TYPE” (REFRIGERANT TYPE) on MESSAGE DISPLAY.

4. Press “DEFROST” (SELECT) switch to lock in on the selection. This programs the proper refrigerant pulse rate into the Dispenser electronics.

5. Press “ERROR RESET” switch two times to exit from “MAIN MENU SELECTIONS”.

## DISPLAYED ERROR CONDITIONS

Displayed error conditions, associated errors, and items affected by the errors are found in Table 9. DISPLAYED ERROR CONDITIONS.

## INSTALLING CONTROL BOX COVER AND BACK, SIDES, AND TOP PANELS ON UNIT

1. Install upper electrical control box cover and secure with four screws.

2. Install back, sides, and top panels on Unit by reversing removal procedure.

| Table 9. DISPLAYED ERROR CONDITIONS | | | | | |
|---|---|---|---|---|---|
| MESSAGE DISPLAY | ERROR | ITEMS AFFECTED BY ERROR | | | |
| | | BEATER MOTOR 1 | BEATER MOTOR 2 | REFRIG 1 | REFRIG 2 |
| Motor 1 | Low Current, < 109, Sensed on motor one | OFF | | OFF | |
| Motor 2 | Low Current, < 109, Sensed on motor two | | OFF | | OFF |
| Motor 1 | High current > 255, Sensed on motor one | OFF | | OFF | |
| Motor 2 | High current > 255, Sensed on motor two | | OFF | | OFF |
| REFRIG | Maximum Run Time on compressor | OFF | OFF | OFF | OFF |
| SYRUP 1 | Syrup Out Side One | | | OFF | |
| SYRUP 2 | Syrup Out Side Two | | | | OFF |
| $CO_2$ OUT | $CO_2$ Out | | | OFF | OFF |
| $H_2O$ | $H_2O$ Out | | | *OFF | *OFF |
| SENSOR 1 | Temp Sensor Inlet One | OFF | OFF | OFF | OFF |
| SENSOR 2 | Temp Sensor Inlet Two | OFF | OFF | OFF | OFF |
| SENSOR 3 | Temp Sensor Outlet | OFF | OFF | OFF | OFF |

* The refrigeration system and carbonator shall continue to operate for 1.5 minutes after a water pressure loss has been detected. If water pressure loss continues beyond 1.5 minutes, the refrigeration system and carbonator will stop.

# OPERATORS INSTRUCTIONS

This section covers the FCB Overcounter Dispenser operating controls and indicators, dispensed product conditions, operating characteristics, operation and maintenance.

**NOTE: No. 1 freeze cylinder is left-hand cylinder facing front of the Unit.**

## CONTROL PANEL SWITCHES AND DISPLAYED MESSAGES

### CONTROL PANEL SWITCHES

“Fill 1” and “Fill 2” Control Switches

**WARNING: Disconnect electrical power to the FCB Overcounter Dispenser to prevent personal injury before attempting any internal maintenance on the Unit. Only qualified personnel should service internal components or electrical wiring.**

“FILL 1” and “Fill 2” control switches, located on control panel (see Figure 7), are touch-type switches and require only pressing to activate. “FILL 1” and “FILL 2” control switches are used when filling syrup systems sold-out floats during syrup replenishing, syrup flavor changeover, or sanitizing syrup systems. After syrup systems sold-out floats have been filled, “FILL 1” and “FILL 2” switches may be used to prevent more product from entering product blender tanks during BRIX test.

“AUTO BLEND 1” and “AUTO BLEND 2” Control Switches.

“AUTO BLEND 1‘’ and “AUTO BLEND 2” control switches, located on control panel (see Figure 7), are touch-type switches and require only pressing to activate. These switches are used to fill product blender tanks after sold-out floats have been filled using “FILL 1” and “FILL 2” switches. “AUTO BLEND 1” and “AUTO BLEND 2” switches must be pressed to operate freeze cylinders beaters and refrigeration system during normal operation.

“WASH 1” and “WASH 2” Control Switches.

“WASH 1” and “WASH 2” control switches, located on control panel (see Figure 7), are touch-type switches and require only pressing to activate. These switches are used to operate freeze cylinders beaters with no refrigeration during sanitizing.

“AUTO 1” and “AUTO 2” Control Switches.

“AUTO 1’’ and “AUTO 2‘’ control switches, located on control panel (see Figure 7), are touch-type switches and require only pressing to activate. These switches are used to operate freeze cylinders beaters and refrigeration system after cylinders have been filled with product. Freeze cylinders beaters and refrigeration system may be stopped by pressing “OFF 1’’ and “OFF 2” switches.

“OFF 1” and “OFF 2” Control Switches

“OFF 1’’ and “OFF 2’’ control switches, located on control panel (see Figure 7), are touch-type switches and require only pressing to activate. These switches are used to stop freeze cylinders beaters and refrigeration system.

“ERROR RESET” Control Switch

“ERROR RESET” control switch, located on control panel (see Figure 7), is a touch-type switch and requires only pressing to activate. “ERROR RESET” switch is used to restore normal operation after error within Unit has been corrected.

“SECURITY SWITCH”

The Unit is equipped with a hidden “SECURITY SWITCH” located between “FILL 1” switch and “ERROR RESET” switch on control panel (see Figure 7). Pressing in and holding “SECURITY SWITCH” for 3-seconds deactivates control switches preventing tampering with Unit normal operation. To reactivate control switches, press in and hold “SECURITY SWITCH” for 3-seconds.

## CONTROL PANEL DISPLAY MESSAGES

(see Figure 7)

“FILL 1” and “FILL 2” Fault Messages

“FILL 1” and “FILL 2” fault messages will appear on message display only when “FILL 1” and “FILL 2” control switches have been pressed and syrup systems sold-out floats have been filled with product. “FILL 1” and “FILL 2” fault messages will continue to be displayed until “AUTO BLEND 1” or “AUTO BLEND 2” control switches have been pressed to fill product blender tanks with product.

“ERROR” Fault Messages

An error fault message will appear on message display only if error within Unit has developed interrupting normal operation. Error will have to be located and corrected, then press “ERROR RESET” to restore normal operation. Error fault message will disappear from display.

“OFF 1” and “OFF 2” Fault Messages.

“OFF 1” and “OFF 2” fault messages will appear on message display when either freeze cylinder beater is not operating

“$H_2O$ OUT” Fault Message.

The Unit plain water inlet system contains a water pressure switch. Should the plain water source to the Unit be disrupted or a water pressure drop occur, will cause “$H_2O$ OUT” fault message to appear on message display. Unit will continue to operate for 1-1/2 minutes after “$H_2O$ OUT” fault message has appeared and if water pressure has not been restored or water pressure improved after 1-1/2 minutes, Unit operation will shut down. After plain water source has been restored or water pressure has improved, Unit will resume operation and “$H_2O$ OUT” fault message will disappear from message display.

“$CO_2$ OUT” Fault Message.

“$CO_2$ OUT” fault message will appear on message display when $CO_2$ supply to Unit has been turned off or if $CO_2$ pressure drops below 50-psi. A minimum $CO_2$ pressure of 75-psi must be available to Unit to extinguish “$CO_2$ OUT” fault message.

“SYRUP 1” or “SYRUP 2” Fault Messages.

“SYRUP 1” or “SYRUP 2” fault messages will appear on message display if product tanks are not connected to Unit or product tanks are empty. Syrup systems syrup float switches must be filled with syrup to extinguish “SYRUP 1” or “SYRUP 2” fault messages.

“DEFROST 1” or “DEFROST 2” Display Messages.

“DEFROST 1” or “DEFROST 2” display messages will appear on message display if either freeze cylinder is in defrost mode. “DEFROST 1” or “DEFROST 2” messages will remain on during defrost cycle and will disappear when cycle has ended.

“POINT OF SALE” Display Message.

Three “POINT OF SALE“ display messages are available to choose from and may be programmed into Unit to appear on message display as instructed in INSTALLATION.

Common Outlet Temperatures.

Evaporator refrigeration coils inlet 1 and inlet 2 and common outlet temperatures may be displayed on control panel message display as instructed in INSTALLATION SECTION.

## FREEZE CYLINDERS MANUAL OR AUTOMATIC DEFROST SYSTEMS

The Unit is equipped with both manual and automatic electric defrost systems. The automatic defrost system may be programmed into the Unit to occur up to nine times a day or system may be completely turned off.

### MANUAL DEFROST SYSTEM

The Manual electric defrost system may be activated at any time by pressing “DEFROST” switch on front of Unit. Refrigeration compressor will operate for a short time, then both freeze cylinders will go into defrost and defrost for approximately 15-minutes. At end of manual defrost cycle, Unit will return to normal operation. Manual defrost may be cancelled at any time by pressing “CANCEL DEFROST” switch.

### AUTOMATIC DEFROST SYSTEM

The Automatic electric defrost system may be programmed into the Unit to occur up to nine different times a day with a minimum of two hours between defrost settings. At start of each automatic defrost cycle, refrigeration compressor will operate for a short time. No. 1 freeze cylinder only will go into defrost cycle and defrost for approximately 15-minutes, then it will return to normal operation. This ends automatic defrost cycle of No. 1 freeze cylinder. No. 2 freeze cylinder will defrost 30-minutes after the start of No. 1 freeze cylinder. The next automatic defrost cycle will occur according to time programmed into the Unit.

## “SLEEP” (SLEEP TIME) OPERATION

“SLEEP” (SLEEP TIME) may be programmed into Unit to allow Unit to go into sleep time (Unit shut down, freeze cylinders beaters and refrigeration systems not operating) At. start of sleep time, refrigeration compressor will operate for 30-seconds to pump freon out of freeze cylinders evaporator coils, then both freeze cylinders will simultaneously go into defrost and defrost for approximately 15-minutes. At end of defrost cycle, Unit will go into “sleep time.”

## “WAKE UP” (WAKE UP TIME)

“WAKE UP” (WAKE UP TIME) may be programmed into the Unit to allow Unit to resume normal operation at a desired time. When the programmed “WAKE UP” time is reached, an alarm will sound for a short duration, then Unit will resume normal operation.

**NOTE: Automatic defrost, sleep time, and wake up time may be used in any combination together or separately.**

## FACEPLATE RELIEF VALVES

The faceplate relief valves (see Figure 7), located in each faceplate, are spring-loaded valves that protect freeze cylinders from accidental over-pressure. The relief valve is also used to manually bleed $CO_2$ gas from freeze cylinder to atmosphere during filing with product and if gas pockets form in cylinder during operation.

## PRODUCT SAMPLE VALVES

The two product sample valves (see Figures 2 and 8), located behind front lower access panel, are manually operated lever-type ball valves used to check product BRIX. Turn valve lever to line up with attached line to open valve and at 90 angle with line to close valve.

## PRODUCT SHUTOFF VALVES

The two product shutoff valves, located in lines leading from product blender tanks to freeze cylinders (see Figures 2 and 8), are manually operated lever-type ball valves and are used to prevent product from entering and filling freeze cylinders while adjusting BRIX of dispensed product. Shutoff valve may also be used to shut off product to individual freeze cylinder for service and maintenance without disrupting operation of other freeze cylinder.

## PRIMARY $CO_2$ REGULATOR

The primary $CO_2$ regulator (see Figure 2) controls $CO_2$ pressure to soft drink tanks and Unit secondary $CO_2$ regulators located behind lower front access panel.

**DRAWING 1**

**DRAWING 2**

**DRAWING 3**

## SECONDARY $CO_2$ REGULATORS

The three secondary $CO_2$ regulators, located behind lower front access panel (see Figures 2 and 8), control $CO_2$ pressure to carbonator and product blender tanks.

## CARBONATED WATER FLOW REGULATORS

The adjustable carbonated water flow regulators (see Figures 2 and 8), located in their respective systems, control carbonated water flow rate to the product blender tanks. The water flow regulators are factory adjusted at $1.5 \pm 0.05$ oz/sec and should not normally require adjustment.

# SYRUP FLOW REGULATORS

The syrup flow regulators (see Figures 2 and 8), located in their respective systems, are adjustable regulators that control syrup flow rate to the product blender tanks for desired BRIX of dispensed product.

# DISPENSING VALVES

Self-closing dispensing valves (see Figures 7 and 9), located on faceplates on front of Unit, are operated one at a time or simultaneously to deliver product to the customer.

# DISPENSED PRODUCT CONDITIONS

## ‘‘OVERRUN’’, AS APPLIED TO FROZEN CARBONATED BEVERAGES

Overrun Defined:

Overrun is product expansion that takes place in the frozen carbonated drink. It is caused primarily by $CO_2$ gas breakout and secondary by freezing.

## OVERRUN IS A VARIABLE

The percentage or degree of overrun depends on a number of factors. The specific syrup, BRIX, low dispensing volume, carbonation level in liquid product, and freezing, all affect overrun. After these factors have been considered, desired viscosity (product consistency) adjustment may be made on the Unit. The viscosity adjustment adjusts product texture from very wet to light.

Specific Product Ingredients Affect Overrun.

Each syrup has its own specific formulation of makeup. Baume, an important ingredient factor, may fall within an extremely wide range. Fruit flavors contain citric acids that colas do not. Colas also differ in ingredients from one brand to another. *Each product formulation has its own peculiarities regarding the way the product will absorb carbonation and the way it will release carbonation.*

BRIX Affects Overrun.

Sugar in carbonated drinks is like anti-freeze in water. The higher the BRIX in a product, the greater resistance the product has to freezing. Conversely, in products with lower BRIX, freezing takes place at higher temperatures than for high-BRIX products. *Thus, BRIX affects overrun because the amount of sugar in a drink has a direct bearing on the product’s freezing characteristics.*

Low Dispensing Volume Affects Overrun.

When Unit sits idle for a period of time and no drinks are dispensed, $CO_2$ gas in the system takes a ‘‘set’’. When first few drinks are drawn off after an idle period, $CO_2$ gas has less tendency to break out as drink is dispensed. The result is these casual drinks have less overrun than drinks dispensed during peak-use periods.

Carbonation Level in Liquid Product Affects Overrun.

The higher the specific carbonation level in a given product, the greater the potential for carbonation breakout in frozen carbonated form of that drink. For example, drinks with 3.0 volume of carbonation will have more gas breakout in frozen carbonated form, and more overrun, than will drinks that contain 2.0 volumes of $CO_2$ gas.

Freezing Affects Overrun:

Freezing causes approximately a 10 percent expansion in dispensed frozen carbonated drink. The degree of freezing is limited because finished drink is intended to be sipped through a straw. This is not possible if product is too ‘‘solid’’.

## OPERATING CHARACTERISTICS

The product viscosity (product consistency) can be varied by adjustment and secondary $CO_2$ regulator setting from a high overrun light drink to a wet heavy drink. The length of freezing cycle and amount of $CO_2$ present in product combine to create drink dispensed. The dispensed product will have a normal variance due to the following conditions:

1. If some time has elapsed since last drink was drawn from particular freeze cylinder and compressor has not cycled on, the drink dispensed will have a tendency to be wetter, have slightly less overrun than normal for the setting, and will not mound up as high. See Drawing 1.

**NOTE: A cylinder freeze-up may be expected under casual draw conditions if an attempt is made to eliminate drink described above by adjusting viscosity.**

2. If product is drawn from freeze cylinder quite regularly, its viscosity (product consistency) will be maintained at whatever viscosity adjustment was made within the normal variance of the compressor off and on cycle. See Drawing 2.

3. If product is drawn continuously from freeze cylinder and rate is approaching capacity of the dispensing unit, overrun of drink will increase just prior to point capacity is exceeded, and drink dispensed will turn slightly wetter.

## OPERATING UNIT

**NOTE: No. 1 freeze cylinder is cylinder on left-hand side facing front of Unit.**

1. Make sure ‘‘$H_2O$ OUT’’ fault message is not displayed on message display. This indicates no water supply to Unit.

2. Make sure ‘‘$CO_2$ OUT’’ fault message is not displayed on message display. This indicates no $CO_2$ gas supply to Unit.

3. Make sure ‘‘SYRUP 1’’ or ‘‘SYRUP 2’’ fault messages are not displayed on message display. This indicates no syrup supply to Unit.

4. Make sure ‘‘AUTO BLEND 1’’, ‘‘AUTO BLEND 2’’, ‘‘AUTO 1’’, and ‘‘AUTO 2’’ control switches are pressed for normal operation.

5. Place cup under dispensing valve, then dispense until cup is full of product.

6. Make sure viscosity (product consistency) is as desired. If not, adjust as instructed.

## REPLENISHING SYRUP SUPPLY

**IMPORTANT: The following $CO_2$ and liquid disconnects disconnecting and connecting procedure for soft drink tank replacement or filling soft drink tank in place *must* be performed in order as follows:**

1. To disconnect soft drink tank from Unit syrup system.

   A. Disconnect liquid soft drink tank. **NOTE - Disconnecting liquid quick disconnect from soft drink tank first prevents syrup from backflowing through Unit syrup flow regulator which may alter regulator adjustments.**

   B. Second, disconnect $CO_2$ quick disconnect from soft drink tank.

2. To connect soft drink tank into Unit syrup system

A. First, connect $CO_2$ quick disconnect to soft drink tank to pressurize tank.

B. Second, connect liquid quick disconnect to soft drink tank.

Syrup supply should be checked daily and if necessary, replenished as instructed in SERVICE AND MAINTENANCE SECTION.

## SYRUP FLAVOR CHANGE

Perform syrup flavor change as instructed in SERVICE AND MAINTENANCE SECTION.

## CHECKING $CO_2$ SUPPLY

**WARNING: $CO_2$ displaces oxygen. Strict attention *must* be observed in the prevention of $CO_2$ (carbon dioxide) gas leaks in the entire $CO_2$ and soft drink system. If a $CO_2$ gas leak is suspected, particularly in a small area, *immediately* ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentration of $CO_2$ gas will experience tremors which are followed rapidly by loss of consciousness and suffocation.**

Make sure $CO_2$ cylinder shutoff valve is fully opened and regulator assembly 1800-psi gage indicator is not in shaded (“changed $CO_2$ cylinder”) portion of dial. If so, $CO_2$ cylinder is almost empty and must be replaced as instructed in SERVICE AND MAINTENANCE SECTION.

## CLEANING AND SANITIZING

### DAILY CLEANING

Daily; or more often if necessary, wash all external surfaces of Unit, rinse with clean water, then wipe dry with clean soft cloth. DO NOT USE ABRASIVE - TYPE CLEANERS. Remove and wash drip tray and cup rest with warm water and mild detergent, rinse with clean water, then install them on Unit.

### SANITIZING

The Unit should be sanitized as instructed in SERVICE AND MAINTENANCE SECTION every 90 days and before and after storage periods following parent company requirements and sanitizer manufacturers recommendations.

## REMOTE REFRIGERATION ASS’Y MAINTENANCE

The Remote Refrigeration Assembly connected to the FCB Overcounter Dispenser is equipped with a condenser coil that must be cleaned every 30-days. Refer to manual provided with the Remote Refrigeration Assembly for condenser coil cleaning instructions.

## LUBRICATION

### CARBONATOR WATER PUMP MOTOR

Carbonator water pump must be periodically lubricated as instructed in SERVICE AND MAINTENANCE SECTION.

# ADJUSTMENTS

## CARBONATED WATER FLOW RATE

The black carbonated water flow regulators (see Figures 2 and 8), which control carbonated water flow rate into product blender tanks, are factory adjusted and normally do not require further adjustment. If adjustment should become necessary, adjust as instructed in SERVICE AND MAINTENANCE SECTION.

## $CO_2$ REGULATORS

Primary $CO_2$ Regulator.

The primary $CO_2$ (see Figure 2) regulator regulates $CO_2$ pressure to soft drink tanks (also to bag-in-box syrup system if used) and secondary $CO_2$ regulators located inside Unit. If necessary to adjust primary $CO_2$ regulator, adjust as instructed in INSTALLATION SECTION.

Secondary $CO_2$ Regulators.

The three secondary $CO_2$ regulators (see Figures 2 and 8) regulate $CO_2$ pressure to carbonator and product blender tanks. If necessary to adjust secondary $CO_2$ regulators, adjust as instructed in INSTALLATION SECTION.

## BRIX (WATER-TO-SYRUP "RATIO) OF DISPENSED PRODUCT

BRIX is Water-to-Syrup "Ratio" (mixture) of dispensed product. If necessary to adjust BRIX, adjust as instructed in INSTALLATION SECTION.

## "VIS SET" (PRODUCT VISCOSITY SETTING)

'VIS SET" (PRODUCT VISCOSITY SETTING) adjustment determines the product consistency of the dispensed product. Adjust product viscosity as instructed in INSTALLATION SECTION.

## PRODUCT CARBONATION

Carbonation of dispensed product can also be varied to the customers preference. If necessary to readjust product carbonation, adjust as instructed in SERVICE AND MAINTENANCE SECTION.

## ADJUSTING BEATER MOTOR CURRENT (EITHER SIDE)

Beater motors currents readouts displayed on message display must be adjusted to read 150 $\pm$ 2 as instructed in INSTALLATION SECTION.

## PROGRAMMING MAIN MENU SELECTIONS ONTO MESSAGE DISPLAY

The MAIN MENU SELECTIONS (see Table 4) may be brought up on message display as instructed in INSTALLATION section.

## SETTING “CLOCK” (TIME OF DAY)

**NOTE: “CLOCK’’ (TIME OF DAY) must be programmed into Unit before “DEFROST’’ (AUTOMATIC), “SLEEP’’ (SLEEP TIME), and “WAKE UP” (WAKE UP TIME) can be programmed into the Unit.**

Program “CLOCK” (TIME OF DAY) into Unit as instructed in INSTALLATION section.

## PROGRAMMING “DEFROST” (AUTOMATIC) SETTINGS INTO UNIT

The automatic defrost system may be programmed into the Unit to occur up to nine different times during a day with a minimum of two hours between defrost time settings. Program automatic defrost time settings into the Unit as instructed in INSTALLATION section.

## PROGRAMMING “SLEEP” (SLEEP TIME) INTO UNIT

“SLEEP’’ (SLEEP TIME) may be programmed into Unit to occur any time of the day after the Unit automatic defrost cycle has occurred. Unit will shut down (go into sleep time) and will not wake up (return to normal operation) until programmed “WAKE UP’’ (WAKE UP TIME) has occurred. Program “SLEEP’’ (SLEEP TIME) into Unit as instructed in INSTALLATION section.

## PROGRAMMING “WAKE UP’’ (WAKE UP) TIME INTO UNIT

“WAKE UP’’ (WAKE UP TIME) May be programmed into Unit to occur any time of the day to wake Unit up (return to normal operation) after “sleep time’’ has occurred. Program “WAKE UP’’ into Unit as instructed in INSTALLATION section.

## PROGRAMMING POINT OF SALE MESSAGE DISPLAY

Three point of sale display messages are available to choose from and may be programmed into Unit by placing No.1 and No. 2, switches on DIP SWITCH assembly on master circuit board in appropriate positions. Program point of sale display messages into Unit as instructed in INSTALLATION section.

## ADJUSTING “VIS SET” (PRODUCT VISCOSITY) OF DISPENSED PRODUCT

Adjusting “VIS SET’’ (PRODUCT VISCOSITY) determines what product consistency of the dispensed product will be present in each freeze cylinder. Adjust “VIS SET’’ (PRODUCT VISCOSITY) of the dispensed product as instructed in INSTALLATION section.

## “VIS READ” (ACTUAL VISCOSITY READOUT) OF PRODUCT IN FREEZE CYLINDERS

“VIS READ” (actual viscosity readout) may be brought up on the message display to actually read the viscosity (product consistency) of product in the freeze cylinders while the Unit is in operation as instructed in INSTALLATION section.

## DISPLAYED EVAPORATOR REFRIGERATION COILS INLETS AND COMMON OUTLET SENSORS TEMPERATURES

Evaporator refrigeration coils inlet and common outlet temperature readings in degrees Fahrenheit may be displayed on message display as instructed in INSTALLATION section.

## "VOLTAGE" (DISPLAYED VOLTAGE READOUT)

Displayed voltage readout may be displayed on message display as instructed in INSTALLATION section.

## PROGRAMMING COMPONENTS "DIAGNOSE" (DIAGNOSTIC MODE) INTO UNIT

"DIAGNOSE" (DIAGNOSTIC MODE) may be programmed into the Unit to check certain components for operation. Program "DIAGNOSE" into Unit and check components for proper operation as instructed in INSTALLATION section.

## DISPLAYING "TOTALS" (DISPLAYED CYCLES AND HOURS TOTALS) ONTO MESSAGE DISPLAY

"TOTALS" (DISPLAYED CYCLES AND HOURS TOTALS) may be displayed on the message display as instructed in INSTALLATION section.

## PROGRAMMING FREEZE CYLINDERS BEATER "MOTORS" INTO UNIT ELECTRONICS

Note in TABLE 6 "BEATER MOTOR SELECT" the number of freeze cylinders beater motors Manufacturer's that are listed. Your Unit was manufactured and equipped with motors from one of these Manufacturer's. A replacement freeze cylinder beater motor is also manufactured by one of these Manufacturer's listed. NOTE THE MANUFACTURER'S NAME ON THE MOTOR(S). THE BEATER MOTOR(S) MANUFACTURER'S NAME(S) MUST BE PROGRAMMED INTO THE UNIT WHICH WILL MATCH THE MOTOR(S) TO THE UNIT ELECTRONICS as instructed in INSTALLATION section.

## DISPLAYED ERROR CONDITIONS

Displayed error conditions, associated errors, and items affected by the errors are found in Table 9 DISPLAYED ERROR CONDITIONS.

## PROGRAMMING PROPER REFRIGERANT TYPE INTO UNIT ELECTRONICS

The Dispenser electronics *must* be programmed for the proper refrigeration pulse rate according to the type of refrigerant gas that has been installed in the refrigeration system. Note Dispenser serial plate for the type of refrigerant gas that has been installed, then proceed to INSTALLATION section for programming instructions.

## WATER STRAINER SCREEN AND DOUBLE LIQUID CHECK VALVE MAINTENANCE

(see Figures 2 and 12)

**WARNING: The carbonator water pump water strainer screen and double liquid check valve must be inspected and serviced after any disruptions (plumbing work, earthquake, etc.) to the water supply system, and at least once a year under normal circumstances. Water pump with no screen or defective screen in strainer would allow foreign particles to foul the double liquid check valve. $CO_2$ gas could then back flow into water system and create health hazard in system.**

Service water strainer screen and double liquid check valve as instructed in SERVICE AND MAINTENANCE SECTION.

## CLEANING $CO_2$ GAS CHECK VALVES

(see Figures 2 and 13)

The $CO_2$ gas check check valves must be inspected and serviced at least once a year under normal conditions, and after any disruption on the $CO_2$ system as instructed in SERVICE AND MAINTENANCE SECTION.

# SERVICE AND MAINTENANCE

This section describes service and maintenance procedures to be performed on the FCB Overcounter Dispenser.

**WARNING: Disconnect electrical power to FCB Overcounter Dispenser to prevent personal injury before attempting any internal maintenance. Only qualified personnel should service internal components or electrical wiring.**

## PREPARING FCB OVERCOUNTER DISPENSER FOR SHIPPING, STORING, OR RELOCATING

**CAUTION: Before shipping, storing, or relocating this Unit, the syrup systems *must* be sanitized and all sanitizing solution *must* be purged from the syrup systems. All water *must* also be purged from the plain and carbonated water systems. A freezing ambient environment will cause residual water in the Unit to freeze resulting in damage to internal components.**

## PERIODIC INSPECTION

1. Make sure $CO_2$ cylinder valve is fully opened and primary $CO_2$ cylinder regulator assembly 1800-psi gage indicator is not in shaded (“change $CO_2$ cylinder”) portion of dial. If so, $CO_2$ cylinder is almost empty and must be replaced.
2. Make sure soft drink tanks contain sufficient amount of syrup for Unit operation.
3. Make sure the Remote Refrigeration Assembly condenser coil is free from debris. Restricting air through the condenser coil will decrease the refrigeration systems cooling efficiency.

## REMOVAL OF DRIP TRAY, BACK PANEL, SIDE PANELS, TOP PANEL, AND LOWER FRONT ACCESS PANEL, AND CONDENSER COIL ACCESS PANEL

(see Figure 7)

**DRIP TRAY**

Lift drip tray up and out of drip tray supports.

### BACK PANEL

Remove two screws securing bottom of back panel, then lift panel straight up to remove.

### SIDE PANELS

Remove screw securing bottom of side panel, then lift panel straight up to remove.

### TOP PANEL

Remove two screws securing top panel, then lift panel up off Unit.

### LOWER FRONT ACCESS PANEL

Remove two screws securing lower front panel, then pull panel down to remove from Unit.

## LUBRICATION

### CARBONATOR WATER PUMP MOTOR

Carbonator water pump motor bearings must be lubricated periodically. Refer to oiling instructions on motor. DO NOT OVER OIL.

### DISPENSING VALVES CAGED O-RINGS AND BEATER DRIVE SHAFT SEALS ASSEMBLIES

**NOTE: Defrost freeze cylinders, shut Unit down, close product shutoff valves in lines leading from product blender tanks to freeze cylinders, then drain product from freeze cylinders.**

Lubricate dispensing valves caged o-rings (see Figure 9) and beaters drive shafts seals assemblies (see Figure 10) each time Unit is sanitized as follows:

**NOTE: Item numbers in parentheses in following steps 1 through 3 are in reference to Figure 3.**

1. Remove HEX NUTS (item 7) and FLATWASHERS (item 6) securing FACEPLATE (item 8) to freeze cylinder, then remove faceplate from cylinder.
2. Carefully remove large O-RING (item 5) from FACEPLATE (item 8).
3. Unscrew RELIEF VALVE (item 9) from FACEPLATE (item 8).
4. Disassemble dispensing valve (see Figure 9) as follows:
    A. Remove two screws and hold-down plates securing spring housing to dispensing valve body, then remove housing.
    B. Remove torsion spring from dispensing valve.
    C. Carefully remove caged O-ring from valve.
    D. Remove knob, spring, sleeve, and lever from dispensing valve.
    E. Remove spring fitting from dispensing valve.
    F. Press valve, with caged O-ring, down and out of dispensing valve body.
    G. Carefully remove caged O-ring from valve.
5. Wash all parts in warm water. Remove all traces of syrup and lubricant, especially from faceplate, O-rings, and dispensing valve. If parts are excessively coated, wipe clean with paper towel to remove syrup and lubricant, especially from caged O-ring and dispensing valve. Use BRUSH (item 11, TABLE 3) to clean faceplates relief valve passages.
6. Submerge all parts in four percent solution of approved sanitizing agent for time recommended by sanitizer manufacturer.

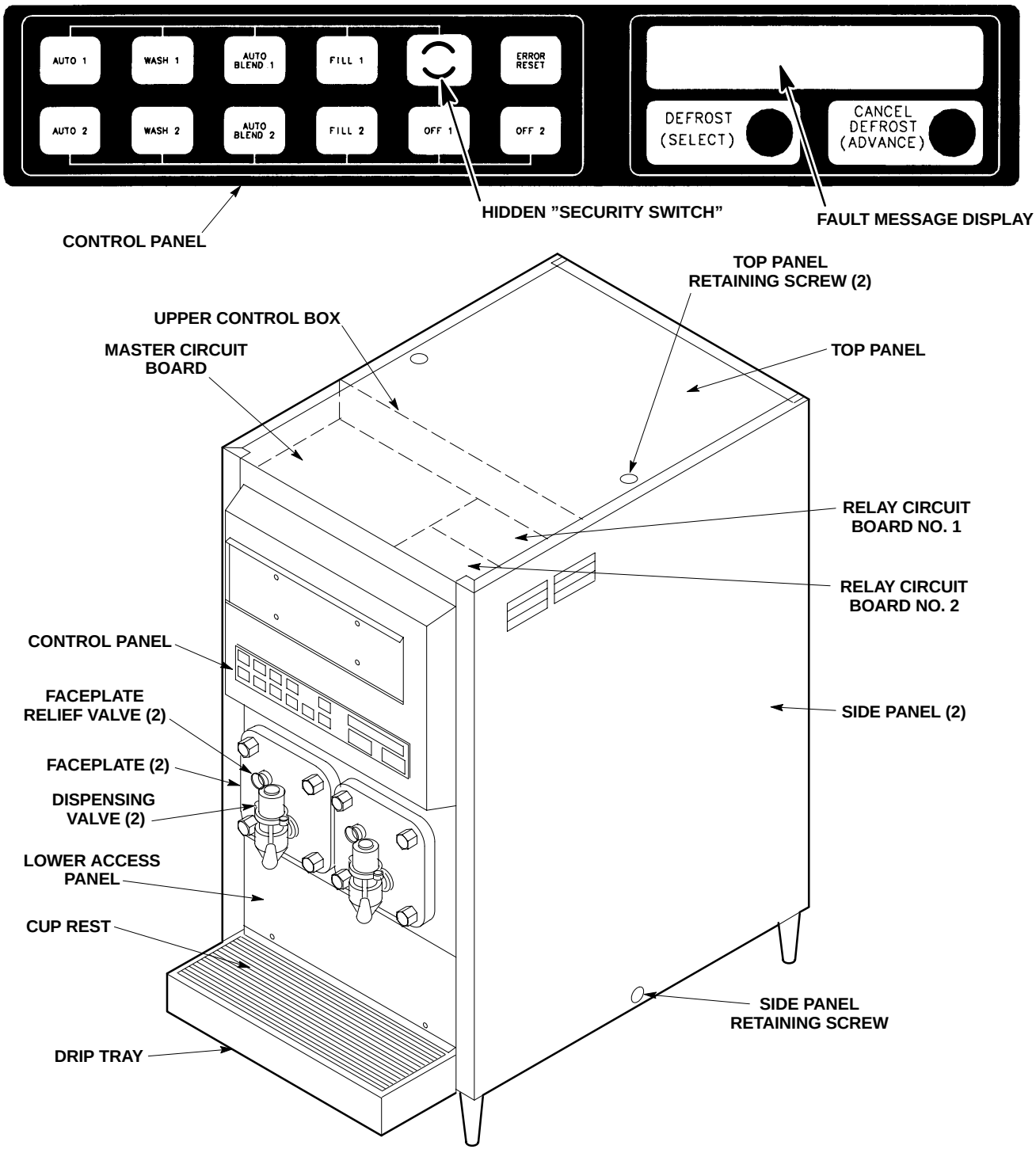



**FIGURE 7. OPERATING CONTROLS**

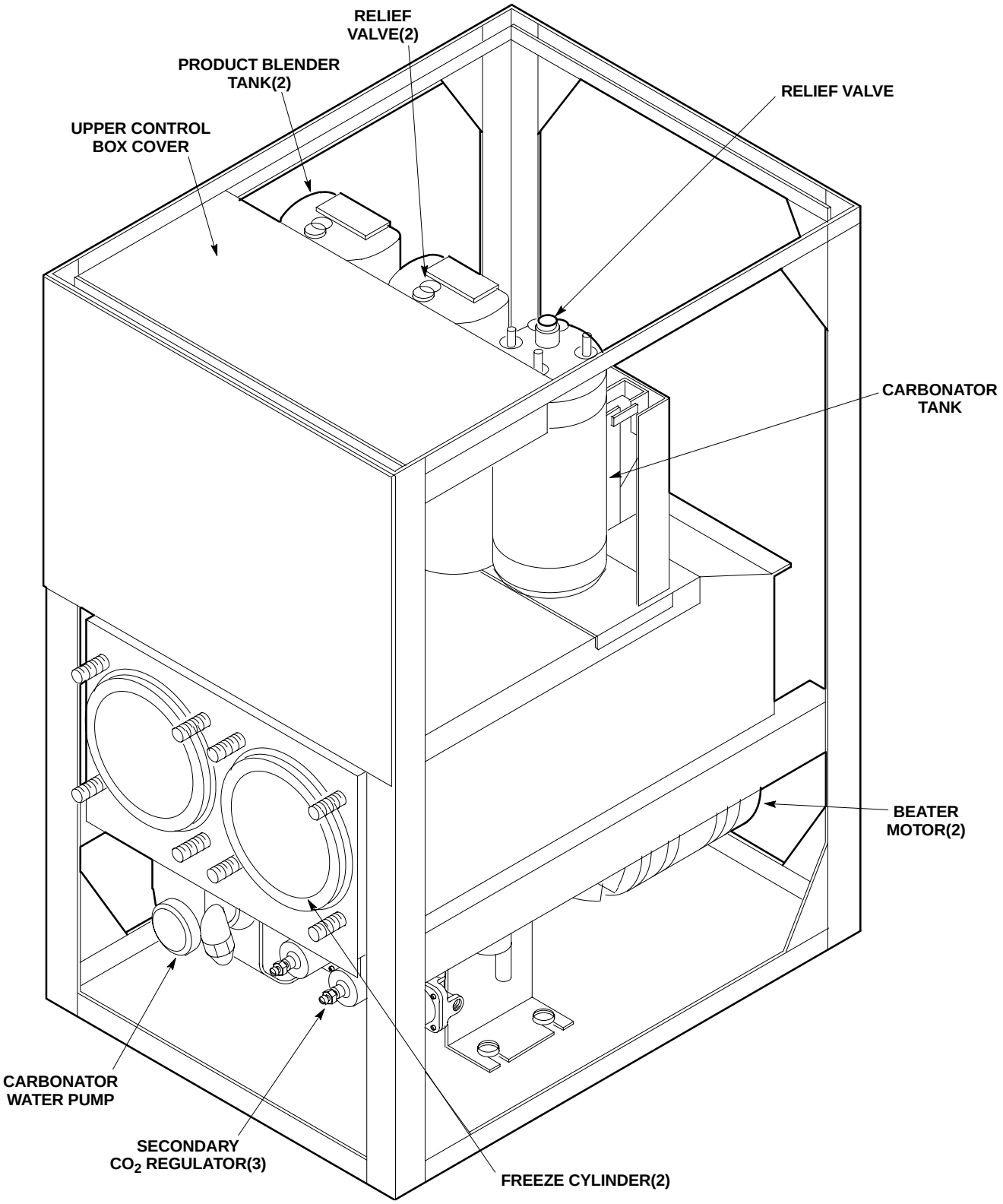



**FIGURE 8. UNIT INTERNAL COMPONENTS**

7. Remove parts from sanitizing solution and place on clean paper towels.

**NOTE: Use Dow-Corning DC-111 (P/N 321471000) light grade silicone lubricant.**

8. Assemble dispensing valve as follows:

   A. Lubricate caged O-ring. Carefully install caged O-ring on valve from straight end (opposite tapered end). Lubricate grooves in which O-ring rides to fill in all void areas around O-ring.

   B. Carefully install valve with caged O-ring in dispensing valve body.

   C. Install spring fitting, knob and lever parts, torsion spring, and spring housing assembly by reversing removal procedure. Do not tighten down hold-down plates securing spring housing at this time.

   D. Turn spring housing to the left (counterclockwise) to put tension on torsion spring, then tighten hold-down plates to secure spring housing.

   E. Test dispensing valve to make sure it closes by itself when lever is released. If not, readjust torsion spring tension.

9. Thoroughly clean RELIEF VALVE (item 9), then screw relief valve into FACEPLATE (item 8) as shown in FIGURE 3.

10. Service beater drive shaft seal assembly as follows

**NOTE: Use Dow-Corning DC-111 (P/N 321471-000) light grade silicone lubricant.**

   A. Pull BEATER (item 13) and SCRAPER BLADES (item 2) as shown in Figure 3 from freeze cylinder.

   B. Pull beater drive shaft seal assembly from freeze cylinder socket using seal puller, Cornelius (P/N 322063-000) from front side. Disassemble shaft seal assembly and discard O-rings.

**NOTE: If old lubricant cannot be removed from plastic sleeve by washing, use nylon "pot and pan" scrubber (3M Company "Scotchbrite'', or equivalent) to remove residue. Do not scrape sleeve. Replace any sleeve that has rough edges in O-ring sealing areas.**

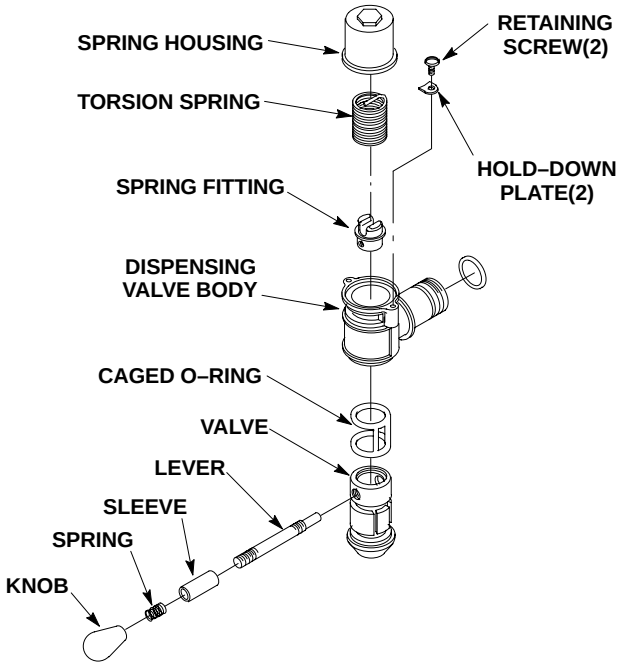



**FIGURE 9. SELF-CLOSING DISPENSING VALVE**

   C. Remove old lubricant from plastic sleeve and stainless steel seal retainer with paper towels. *Do not scrape the sleeve.* Wash sleeve, retainer, and socket and back of freeze cylinder in warm water.

D. Install No. 1 stationary O-ring in groove of plastic sleeve and No. 2 stationary O-ring in inner groove of stainless steel seal retainer. Lubricate both O-rings.

E. Install new “running” O-rings No. 3 and No. 4 in outer grooves of stainless steel seal retainer, then lubricate O-rings with generous amount of special light grade silicone grease.

F. Slide stainless steel seal retainer in plastic sleeve until “running” O-ring No. 3 is just covered by plastic sleeve, as shown in View B of Figure 10.

G. Carefully place shaft seal assembly over beater drive shaft and locate slots of seal retainer on drive shaft pin. Then, carefully and simultaneously, push and turn plastic sleeve to locate locking tabs on sleeve in notches of freeze cylinder retainer. When tabs are seated in notches, press assembly firmly in place.

H. Position SCRAPER BLADES (item 2) on BEATER (item 13) as shown in Figure 3. Slide beater into freeze cylinder so slotted hooks engage DRIVE PIN (item 17) on DRIVE SHAFT (item 24). Turn beater to the right (clockwise) to lock in place.

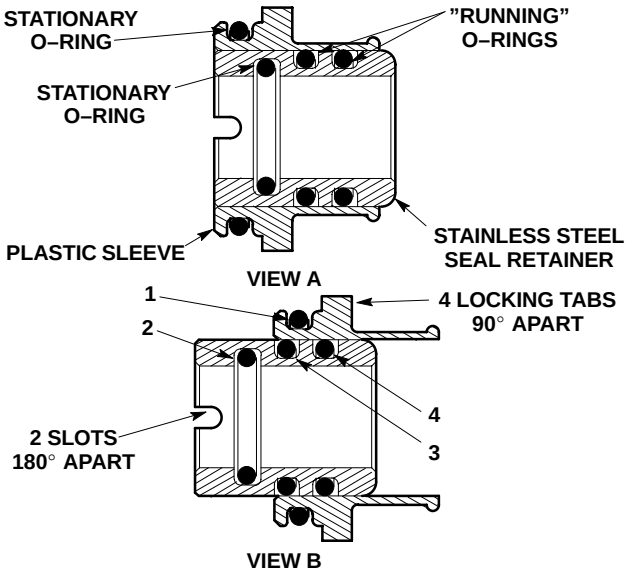



**FIGURE 10. SERVICING BEATER DRIVE SHAFT SEAL ASSEMBLY**

I. Lubricate O-RING (item 5) with water to facilitate faceplate installation. Position O-RING (item 5) on FACEPLATE (item 8). Install faceplate on Unit so dispensing valve spout faces down. (MAKE SURE FEMALE END OF THE BEATER IS PLACED OVER THE FACEPLATE STAINLESS–STEEL STUD AND BUSHING BEFORE PUSHING THE FACEPLATE INTO POSITION ON IT’S FOUR THREADED MOUNTING STUDS). Tighten hex nuts until faceplate touches freeze cylinder all around flange. CAUTION - DO NOT OVERTIGHTEN HEX NUTS.

11. Open product shutoff valves leading from product blender tanks to freeze cylinders. Fill freeze cylinders with product, then restore Unit to operation.

# CLEANING REMOTE REFRIGERATION ASS’Y CONDENSER COIL

The Remote Refrigeration Assembly connected to the FCB Overcounter Dispenser is equipped with a condenser coil that *must* be cleaned every 30 days. Refer to manual provided with the Remote Refrigeration Assembly for condenser coil cleaning instructions.

# ADJUSTMENTS

## ADJUSTING PLAIN WATER PRESSURE REGULATOR

(see Figures 2 and 12)

Carbonator plain water inlet adjustable water pressure regulator is factory adjusted to 45-psi and *should* not be readjusted.

## ADJUSTING CARBONATED WATER FLOW RATE

The black carbonated water flow regulators (see Figures 2 and 12), which control carbonated water flow rate into product blender tanks, are factory adjusted for flow rate of 1.5 ± 0.05 ounces per second and normally do not require adjustment. However, if adjustment is necessary, proceed as follows:

1. Press applicable “OFF 1” or “OFF 2” switch to prevent more product from entering applicable product blender tank.
2. Disconnect Unit syrup inlet line from applicable soft drink tank.
3. Remove applicable side panel from Unit as instructed for access to applicable carbonated water flow regulator, product shutoff valve, and product sample valve.
4. Close applicable product shutoff valve to prevent more product from entering freeze cylinder.
5. Place container under applicable product sample valve. Open valve and allow all product to be purged from product blender tank, then close valve.
6. Remove lower front access panel as instructed for access to secondary $CO_2$ regulators.
7. Note pressure setting on secondary $CO_2$ regulator with 60-psi gage for product blender tanks. Turn regulator adjusting screw out (counterclockwise) until gage reads 0-psi. Pull up on applicable product blender tank relief valve to release $CO_2$ pressure from tank.
8. Disconnect carbonated water line from outlet side of applicable carbonated water flow regulator.
9. Connect line, long enough to reach to outside of Unit, to water flow regulator outlet, then route line to outside of Unit.
10. Place end of carbonated water line, routed to outside of Unit, in container.
11. Press applicable “AUTO BLEND 1” or “AUTO BLEND 2” switch to activate electrically operated carbonated water solenoid.
12. When steady stream of water is flowing from added length of line, catch carbonated water in container graduated in ounces for exactly 10-seconds. Press applicable “FILL 1” or “FILL 2” switch to deactivate carbonated water solenoid. In 10-seconds, 14 to 16-ounces of water should have been dispensed.
13. If adjustment is necessary, loosen jam nut on carbonated water flow regulator. Turn regulator adjusting screw to the left (counterclockwise) to reduce carbonated water flow rate or turn screw to the right (clockwise) to increase flow rate. Tighten jam nut and tap on regulator to register adjustment.
14. Repeat steps 11 through 13 until desired carbonated water flow rate is achieved.
15. Remove added length of line from outlet side of carbonated water flow regulator. Connect carbonated water line, disconnected from carbonated water flow regulator in step 8 preceding, to regulator outlet.
16. Turn product blender tanks $CO_2$ regulator, with 60-psi gage, adjusting screw in (clockwise) until gage registers pressure noted in step 7 preceding.
17. Pull relief valve on applicable product blender tank to purge air from tank, then close valve.
18. Connect Unit syrup inlet line to soft drink tank.
19. Press applicable “AUTO BLEND 1” or “AUTO BLEND 2” switch to fill product blender tank with product.
20. Open product shutoff valve that was closed in step 4 preceding.
21. Install side panel and lower front access panel by reversing removal procedure.

## ADJUSTING $CO_2$ REGULATORS

Primary $CO_2$ Regulator.

The primary $CO_2$ (see Figure 2) regulator regulates $CO_2$ pressure to soft drink tanks (also to bag-in-box syrup system if used) and secondary $CO_2$ regulators located inside Unit. If necessary to adjust primary $CO_2$ regulator, adjust as instructed in INSTALLATION SECTION.

Secondary $CO_2$ Regulators.

The three secondary $CO_2$ regulators (see Figures 2 and 8) regulate $CO_2$ pressure to carbonator and product blender tanks. If necessary to adjust secondary $CO_2$ regulators, adjust as instructed in INSTALLATION SECTION.

## ADJUSTING BRIX (WATER-TO-SYRUP) "RATIO" OF DISPENSED PRODUCT

(see Figures 2 and 8)

1. Remove Unit front lower access panel as instructed for access to product blender tanks secondary $CO_2$ regulators and product sample valves.
2. Check product blender tanks secondary $CO_2$ regulators, with 60-psi gages, for proper pressure settings which is set at 27 ± 2-psi for best textured dispensed product. If adjustment is necessary, adjust as instructed.
3. Remove both Unit side panels as instructed for access to product shutoff valves located close to product blender tanks.
4. Close product shutoff valve in line between applicable product blender tank and associated freeze cylinder BRIX adjustment will be performed on.
5. Press applicable "FILL 1" or "FILL 2" switch to prevent more product from filling product blender tank.
6. Open applicable product blender tank product sample valve and take sample (approximately 6-ounces) of product in cup.

**NOTE: Temperature compensated hand-type refractometers (P/N 511004-000) are available from the IMI Cornelius Inc.**

7. Check product BRIX with a temperature compensated hand-type refractometer. BRIX should read 14 ± 3. If BRIX is not within tolerance, adjust applicable white syrup flow regulator as follows:
   A. Loosen jamb nut on applicable syrup flow regulator.
   B. Turn syrup flow regulator adjusting screw to the left (counterclockwise) no more than 1/8-turn at a time to reduce syrup flow rate or turn screw to the right (clockwise) no more than 1/8-turn to increase flow rate.
   C. Tighten jamb nut on syrup flow regulator, then lightly tap regulator to register adjustment.
8. Place container under applicable product sample valve. Open valve to purge product out of product blender tank, line, and valve, then close valve.
9. Press applicable "AUTO BLEND 1" or "AUTO BLEND 2" switch to fill product blender tank 1/4-full of new batch of product. When product blender tank is 1/4-full of product, press applicable "FILL 1" or "FILL 2" switch to prevent more product from entering product blender tank.
10. Repeat steps 6 and 7 preceding to check product sample for BRIX.
11. Repeat steps 7 through 10 preceding until proper BRIX adjustment is achieved.
12. Open product shutoff valve in line between product blender tank and freeze cylinder.
13. Press applicable "AUTO BLEND 1" or "AUTO BLEND 2" switch.
14. Install Unit side panels and front lower access panel by reversing removal procedures.

## PRODUCT CARBONATION ADJUSTMENT

(see Figures 2 and 8)

Carbonation of dispensed product can also be varied to suit consumer preference by adjusting Unit carbonator secondary $CO_2$ regulator as follows:

**IMPORTANT: Carbonator tank secondary $CO_2$ regulator *must* be adjusted 25-psi higher or more above product blender tanks secondary $CO_2$ regulators pressure settings. Carbonated water and syrup pressures *must* be able to overcome and vent product blender tanks head pressures while tanks are filling with carbonated water and syrup. Carbonator tank secondary $CO_2$ regulator not adjusted high enough will cause decreased flow of carbonated water into blender tanks which will increase BRIX of dispensed product.**

1. Remove Unit front lower access panel as instructed for access to carbonator secondary $CO_2$ regulator with 100-psi gage.

2. Observe pressure setting on carbonator secondary $CO_2$ regulator gage.

3. To lower $CO_2$ pressure, loosen regulator adjusting screw lock nut. Turn adjusting screw to the left (counterclockwise) until pressure gage reads 15-psi below desired reading, then turn screw to the right (clockwise) until gage reads desired pressure. DO NOT SET $CO_2$ REGULATOR PRESSURE BELOW 25-PSI HIGHER THAN PRODUCT BLENDER TANKS $CO_2$ REGULATORS ARE ADJUSTED TO (SEE PRECEDING **IMPORTANT** NOTE). Tighten adjusting screw lock nut after each adjustment.

4. To raise $CO_2$ pressure, turn regulator adjusting screw to the right (clockwise) until gage reads desired pressure. DO NOT SET PRESSURE HIGHER THAN 60-PSI. Make sure primary $CO_2$ regulator on $CO_2$ cylinder is set at 80 to 100-psi. Tighten adjusting screw lock nut after each adjustment.

5. Install Unit front lower access panel by reversing removal procedure.

# CLEANING AND SANITIZING

## DAILY CLEANING OF UNIT

Daily, or more often if necessary, wash all external surfaces of Unit with a mild soap solution. Rinse with clean water, then wipe dry with a clean soft cloth. DO NOT USE ABRASIVE-TYPE CLEANERS. Remove and wash drip tray in mild soap solution, rinse with clean water, then install drip tray on Unit.

## SANITIZING SYRUP SYSTEMS

**NOTE: The Unit should be sanitized every 90-days following Sanitizer Manufacturer's recommendation. Use Chlor-Tergent (Oakite Products, Inc.) or equivalent sanitizer.**

The Unit should be sanitized every 90-days and before and after storage periods following parent company requirements and sanitizer manufacturer's recommendations. One or both syrup systems may be sanitized at one time for routine 90-days sanitizing requirements. The following sanitizing instructions use No. 1 syrup system as an example. No. 2 syrup systems sanitizing instructions are identical to No. 1 syrup system with exception of using applicable system switches. Proceed as follows:

1. Press ''OFF 2'' switch to stop beater motor and refrigeration in No. 2 freeze cylinder which is not to be defrosted. ''OFF 2'' fault message will appear on message display.

2. Press ''DEFROST'' switch to start defrost cycle on No. 1 freeze cylinder. ''DEFROST 1'' message will appear on message display as long as defrost cycle is in progress.

3. Immediately press ''AUTO 2'' control switch to restart beater in No. 2 freeze cylinder. Refrigeration in No. 2 cylinder will not be operating.

4. Remove right-hand side panel as instructed for access to No. 2 product blender tank product shutoff valve.

5. Close No. 2 product blender tank product shutoff valve to prevent product bleeding back into No. 1 product blender tank during sanitizing procedure.

**IMPORTANT: The following $CO_2$ and liquid disconnects disconnecting and connecting procedure for soft drink tank replacement or filling soft drink tank in place *must* be performed in order as follows:**

To disconnect soft drink tank from Unit syrup system.

A. Disconnect liquid soft drink tank. NOTE - Disconnecting liquid quick disconnect from soft drink tank first prevents syrup from backflowing through Unit syrup flow regulator which may alter regulator adjustments.

B. Second, disconnect $CO_2$ quick disconnect from soft drink tank.

To connect soft drink tank into Unit syrup system.

C. First, connect $CO_2$ quick disconnect to soft drink tank to pressurize tank.

D. Second, connect liquid quick disconnect to soft drink tank.

6. Disconnect soft drink tank containing syrup from No. 1 syrup system.

7. Connect clean empty soft drink tank into No. 1 syrup system.

8. Place waste container under No. 1 cylinder dispensing valve nozzle. Open dispensing valve and dispense all product from cylinder. As product level lowers in cylinder, partially close valve to avoid spurting.

9. Remove Unit front lower access panel as instructed for access to No. 1 product blender tank product sample valve.

10. Place waste container under No. 1 product blender tank product sample valve. Slowly open valve and purge remaining product out of tank, then close valve.

11. Disconnect empty soft drink tank from No. 1 syrup system.

12. Refer to DISPENSING VALVES CAGED O-RINGS AND DRIVE SHAFTS SEALS ASSEMBLIES under LUBRICATION and perform procedure to lubricate dispensing valve caged O-ring and drive shaft seal assembly.

**WARNING: To avoid possible in jury or property damage, do not attempt to remove soft drink tank cover until $CO_2$ pressure has been released from tank.**

13. Pull up on empty soft drink tank cover relief valve to release $CO_2$ pressure from tank.

**WARNING: If powder type sanitizer is used, it must be thoroughly dissolved with water prior to adding to soft drink tank.**

**NOTE: Sanitizing solution is used in a more concentrated form because it will be diluted approximately four-to-one in product blender tank.**

14. Using clean empty soft drink tank, prepare full tank of sanitizing solution using Chlor-Tergent (Oakite Product, Inc.) or equivalent sanitizer. Mix sanitizing solution by using 70° F to 100° F (max) plain water and 2.65 oz./gallon sanitizer. This mixture will provide 800-ppm of chlorine. Sanitizing solution will be diluted to approximately 200-ppm inside product blender tank after carbonated water has been mixed with sanitizing solution.

15. Shake sanitizing solution tank to thoroughly mix solution, then connect tank into No. 1 syrup system.

16. Press ‘‘FILL 1’’ switch to fill No. 1 syrup system syrup float switch with sanitizing solution ‘‘SYRUP 1’’ fault message on message display will go out indicating syrup float switch has been filled with sanitizing solution.

17. Press ‘‘AUTO BLEND 1’’ switch to fill No. 1 product blender tank with sanitizing solution. Carbonator water pump will start and begin pumping carbonated water into product blender tank which will dilute sanitizing solution also entering tank.

18. After carbonator water pump cycles off, completely fill No. 1 freeze cylinder with sanitizing solution by repeatedly pulling and releasing relief valve knob on freeze cylinder faceplate and until sanitizing solution comes out of relief valve port. Open dispensing valve until sanitizing solution flows from valve, then close valve. Open product blender tank sample valve until sanitizing solution flows from valve, then close valve.

19. Press “WASH 1” switch to start No. 1 freeze cylinder beater. Allow sanitizing solution to remain in freeze cylinder for no less than 10 and no more than 15-minutes (max) contact time.

20. When sanitizing solution contact time has elapsed, press “OFF 1” switch to stop No. 1 freeze cylinder beater.

21. Hold appropriate container under dispensing valve and dispense until soft drink tank containing sanitizing solution is empty and all sanitizing solution has been dispensed from freeze cylinder. As sanitizing solution level lowers in freeze cylinder, partially close valve to avoid spurting. Dispose of sanitizing solution in a safe way.

22. Place waste container under No. 1 system product sample valve. Slowly open valve and purge remaining sanitizing solution out of product blender tank, then close valve

23. Disconnect empty sanitizing solution tank from No. 1 syrup system, then release $CO_2$ pressure from tank by pulling up on cover relief valve.

24. Pull freeze cylinder faceplate relief valve to release all $CO_2$ pressure from cylinder.

25. Remove knurled nuts securing faceplate assembly to freeze cylinder.

26. Hold waste container below freeze cylinder, then pull faceplate off freeze cylinder and allow remaining sanitizing solution to drain from cylinder.

27. Being careful not to touch inside surface (surface that goes inside freeze cylinder) of faceplate assembly, install faceplate on freeze cylinder and secure with knurled nuts.

28. Connect soft drink tank containing syrup into No. 1 syrup system.

**WARNING: Flush residual sanitizing solution from syrup system as instructed. Residual solution left in system could create a heath hazard.**

29. Press “FILL 1” switch to fill No. 1 syrup system syrup float switch with syrup. “SYRUP 1” fault message on message display will go out indicating syrup float switch has been filled with syrup.

30. Press “AUTO BLEND 1” switch to fill No. 1 Product blender tank with product. Carbonator water pump will start and begin pumping carbonated water into product blender tank along with syrup to make product.

31. After carbonator water pump cycles off, completely fill No.1 freeze cylinder with product by repeatedly pulling and releasing faceplate relief valve until product comes out of relief valve port. Open dispensing valve until product flows from valve, then close valve. Open No. 1 system product sample valve until product flows from valve, then close valve.

32. Press “WASH 1” switch to start No. 1 freeze cylinder beater. Allow beater to operate for five minutes, then press “OFF 1” switch to stop beater.

33. Disconnect soft drink tank containing syrup from No. 1 syrup system.

34. Connect clean empty soft drink tank into No. 1 syrup system

35. Hold appropriate container under dispensing valve and dispense until all product has been dispensed from freeze cylinder. As product level lowers in freeze cylinder, partially close valve to avoid spurting.

36. Place waste container under No. 1 system product sample valve. Slowly open valve and purge remaining product out of product blender tank.

37. Disconnect empty soft drink tank from No.1 syrup system, then release $CO_2$ pressure from tank by pulling up on cover relief valve.

38. Pull both freeze cylinder faceplate relief valves to release all $CO_2$ pressure from cylinders.

39. Remove knurled nuts securing faceplate assembly to freeze cylinder.

40. Hold waste container below freeze cylinder, then pull faceplate off freeze cylinder and allow remaining product to drain from cylinder.

41. Being careful not to touch inside surface (surface hat goes inside freeze cylinder) of faceplate assembly, install faceplate on freeze cylinder and secure with knurled nuts.

42. Connect soft drink tank containing syrup into No. 1 syrup system.

43. Press ‘‘FILL 1’’ switch to fill No. 1 syrup system syrup float switch with syrup. ‘‘SYRUP 1’’ fault message on message display will go out indicating syrup float switch has been filled with syrup.

44. Press ‘‘AUTO BLEND 1’’ switch to fill No. 1 product blender tank with product. Carbonator water pump will start and begin pumping carbonated water into product blender tank along with syrup to make product.

**CAUTION: Do not relieve freeze cylinder pressure too fast or product will foam excessively in cylinder and lose carbonation.**

45. After carbonator water pump cycles off, intermittently pull and release No. 1 freeze cylinder faceplate relief valve. This bleeds $CO_2$ from freeze cylinder and allows product to enter and fill cylinder.

46. Open No. 2 Product blender tank product shutoff valve.

47. Press both ‘‘AUTO 1’’ and ‘‘AUTO 2’’ switches to start both freeze cylinders beaters and refrigeration system. Product will be ready for dispensing in approximately 10-Minutes.

48. Install right-hand side panel and front lower access panel by reversing removal procedure.

# YEARLY (OR AFTER WATER SYSTEM DISRUPTION)

## SERVICING CARBONATOR WATER PUMP WATER STRAINER SCREEN

(see Figure 12)

**WARNING: The carbonator water pump water strainer screen and double liquid check valve must be Inspected and serviced after any disruptions (plumbing work, earthquake, etc.) to the water supply system, and at least once a year under normal circumstances, Water pump with no strainer screen or defective screen would allow foreign particles to foul the double liquid check valves. $CO_2$ gas could then back flow into water system and create health hazard in water system.**

1. Press ‘‘OFF 1’’ and ‘‘OFF 2’’ switches to stop freeze cylinders beaters and refrigeration systems.

2. Disconnect electrical power from Unit.

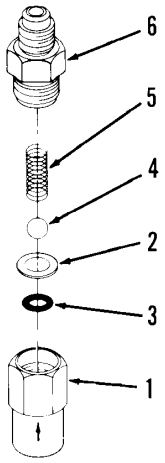
3. Close $CO_2$ cylinder and water inlet supply line shutoff valve.

4. Remove lower front access panel and left-side panel as instructed for access to the water pump water strainer screen.

5. Pull up on carbonator tank relief valve plastic cover to release $CO_2$ pressure from tank.

6. Pull strainer screen from screen retainer. Clean any sediment from screen retainer and water pump port.

7. Inspect strainer screen for holes, restrictions, corrosion, and other damage. Discard damaged strainer screen.




| INDEX NO | PART NO | NAME |
|---|---|---|
| 1 | 317965 | Retainer |
| 2 | 312196 | Spring |
| 3 | 312419 | Ball |
| 4 | 312415 | Washer, .300 I.D. |
| 5 | 312418 | Quad Ring |
| 6 | 317963 | Body |

*Install new ball seat each servicing.

**FIGURE 11. LIQUID CHECK VALVE ASSEMBLY**

8. Check O-ring on screen retainer. Replace worn or damaged O-ring (P/N 315349-000).

**NOTE: Strainer screen should always be used otherwise particles could foul double liquid check valve.**

9. Install good or new strainer screen (P/N 315348-000) in screen retainer, then screw retainer into water pump port and tighten securely.

10. Proceed to SERVICING CARBONATOR WATER PUMP DOUBLE LIQUID CHECK VALVE.

## SERVICING CARBONATOR WATER PUMP DOUBLE LIQUID CHECK VALVE

(see Figures 2 and 12)

1. Service water pump water strainer screen before servicing water pump double liquid check valve.

2. Disconnect carbonator tank water line from double liquid check valve assembly outlet.

3. Remove double liquid check valve assembly from elbow in water pump outlet port. Retain white tapered gasket inside inlet (female) end of double liquid check valve.

4. Disassemble each check valve as shown in Figure 11.

5. Wipe each part with clean lint-free cloth. Inspect each part, especially ball for burrs, nicks, corrosion, deterioration, and other damage. Discard ball seat and any damaged or suspicious parts and replace with new parts during reassemble.

6. Reassemble liquid check valves as shown in Figure 11. ALWAYS INSTALL NEW BALL SEAT (QUAD RING) P/N 312418-000.

**NOTE: Make sure when assembling check valves together, check valve female end with white tapered gasket inside is on inlet side of double liquid check valve assembly.**

7. Assemble check valves together. DO NO OVERTIGHTEN.
8. Make sure white tapered gasket is in place inside female end of double liquid check valve assembly, then install check valve assembly on elbow in water pump outlet port.
9. Connect carbonator tank water line to double liquid check valve assembly outlet. DO NOT OVERTIGHTEN.
10. Open $CO_2$ cylinder and water inlet supply lines shutoff valves. Check for water leaks and tighten any loose connections.
11. Install Unit back panel by reversing removal procedure.
12. Connect electrical power to Unit.
13. Press both ‘‘AUTO BLEND 1’’ and ‘‘AUTO BLEND 2’’ switches.
14. Press both ‘‘AUTO 1’’ and ‘‘AUTO 2’’ switches to start freeze cylinders beaters and refrigeration system.

## REPLENISHING SYRUP SUPPLY

**NOTE: Sugar free diet syrup cannot be used with this Unit.**

Although syrup replenishing can be done anytime, syrup supply must be replenished when either ‘‘SYRUP 1’’ or ‘‘SYRUP 2’’ fault messages are displayed on message display indicating either No. 1 or No. 2 syrup system soft drink tank is empty.

**NOTE: The following instructions are applicable only when replenishing syrup supply. Refer to *SYRUP FLAVOR CHANGE* when changing syrup flavors.**

1. Press applicable ‘‘OFF 1’’ or ‘‘OFF 2’’ switch to stop applicable freeze cylinder beater and refrigeration system.

**IMPORTANT: The following $CO_2$ and liquid disconnect and connecting procedure for soft drink tank replacement or filling soft drink tank in place *must* be performed in order as follows:**

<u>To disconnect soft drink tank from Unit syrup system:</u>

A. Disconnect liquid disconnect from soft drink tank. **NOTE - Disconnecting liquid quick disconnect from soft drink tank first prevents syrup from backflowing through Unit syrup flow regulator which may alter regulator adjustment.**

B. Second, disconnect $CO_2$ quick disconnect from soft drink tank.

<u>To connect soft drink tank into Unit syrup system:</u>

C. First, connect $CO_2$ quick disconnect to soft drink tank to pressurize tank.

D. Second, connect liquid quick disconnect to soft drink tank.

2. Disconnect inlet ($CO_2$) and outlet (syrup) lines from empty soft drink tank.
3. Check soft drink tank quick disconnects for sticky or restricted operation. Rinse disconnects in warm water.
4. First, pressurize full soft drink tank by connecting $CO_2$ line to tank, then connect Unit syrup inlet line to tank.
5. Press applicable ‘‘FILL 1’’ or ‘‘FILL 2’’ switch to fill applicable No. 1 or No. 2 syrup system syrup float switch with syrup.
6. Press applicable ‘‘AUTO BLEND 1’’ or ‘‘AUTO BLEND 2’’ switch to fill applicable No. 1 or No. 2 system product blender tank with product.

7. Press applicable “AUTO 1” or “AUTO 2” switch to start refrigeration system and beater in applicable No. 1 or No. 2 freeze cylinder.

8. If freeze cylinder is not full of product, repeatedly pull and release faceplate relief valve to slowly bleed $CO_2$ from freeze cylinder and allow product to fill cylinder. Do not relieve freeze cylinder pressure too fast or product will foam excessively in cylinder and lose carbonation.

## SYRUP FLAVOR CHANGE

One or both syrup flavors can be changed at the same time. Perform flavor change on one system as follows:

1. Perform sanitizing procedure on syrup system syrup flavor change will be made on as instructed in SERVICE AND MAINTENANCE.

**IMPORTANT: The following $CO_2$ and liquid disconnects disconnecting and connecting procedure for soft drink tank replacement or filling soft drink tank in place *must* be performed in order as follows:**

To disconnect soft drink tank from Unit syrup system:

A. Disconnect liquid disconnect from soft drink tank. **NOTE - Disconnecting liquid disconnect from soft drink tank first prevents syrup from backflowing through Unit syrup flow regulator which may alter regulator adjustment.**

1. Perform sanitizing procedure on syrup system syrup flavor change will be made on as instructed in SERVICE AND MAINTENANCE.

A. Second, disconnect $CO_2$ quick disconnect from soft drink tank.

To connect soft drink tank into Unit syrup system:

B. First, connect $CO_2$ quick disconnect to soft drink tank to pressurize tank.

C. Second, connect liquid quick disconnect to soft drink tank.

2. First, pressurize soft drink tank containing new flavor syrup by connecting $CO_2$ line to tank, then connect Unit syrup inlet line to tank.

3. Press applicable “FILL 1” or “FILL 2” switch to fill applicable No. 1 or No. 2 syrup system syrup float switch with syrup.

4. Press applicable “AUTO BLEND 1” or “AUTO BLEND 2” switch to fill applicable No. 1 or No. 2 system product blender tank with product.

5. Press applicable “AUTO 1” or “AUTO 2” switch to start refrigeration system and beater in applicable No. 1 or No. 2 freeze cylinder.

**CAUTION: Do not relieve freeze cylinder pressure too fast or product will foam excessively in freeze cylinder and lose carbonation.**

6. After carbonator water pump cycles off, intermittently pull and release applicable No. 1 or No. 2 freeze cylinder faceplate relief valve. This bleeds $CO_2$ from freeze cylinder and allows product to enter and fill cylinder.

7. If necessary, adjust BRIX, product viscosity (product consistency), and product carbonation of dispensed product as instructed.

## REPLENISHING $CO_2$ SUPPLY

**WARNING: $CO_2$ displaces oxygen. Strict attention *must* be observed in the prevention of $CO_2$ (carbon dioxide) gas leaks in the entire $CO_2$ and soft drink system. If a $CO_2$ gas leak is suspected, particularly in a small area, *immediately* ventilate the contaminated area before attempting to repair the leak. Personnel exposed to high concentration of $CO_2$ gas will experience tremors which are followed rapidly by loss of consciousness and suffocation.**

**NOTE: When indicator on primary $CO_2$ cylinder regulator assembly 1800-psi gage is in shaded ("change $CO_2$ cylinder") portion of the dial, $CO_2$ cylinder is almost empty and should be changed.**

1. Fully close (clockwise) $CO_2$ cylinder valve.
2. Slowly loosen $CO_2$ regulator assembly coupling nut allowing $CO_2$ pressure to escape, then remove regulator assembly from empty $CO_2$ cylinder.
3. Unfasten safety chain and remove empty $CO_2$ cylinder.
4. Position full $CO_2$ cylinder and secure with safety chain.

**WARNING: To avoid personal injury and/or property damage, always secure $CO_2$ cylinder in upright position with safety chain to prevent it from falling over. Should valve become accidentally damaged or broken off, $CO_2$ cylinder can cause serious personal injury.**

5. Make sure gasket is in place inside $CO_2$ regulator coupling nut, then install regulator on $CO_2$ cylinder.
6. Open (counterclockwise) $CO_2$ cylinder valve slightly to allow lines to slowly fill with gas, the open valve fully to back-seat valve. (Back-seating valve prevents leakage around valve shaft).
7. Check $CO_2$ connections for leaks. Tighten loose connections.

## CLEANING $CO_2$ GAS CHECK VALVES

(see figures 2 and 12)

The $CO_2$ gas check valves must be inspected and serviced at least once a year under normal conditions and after any servicing or disruption of the $CO_2$ system. ALWAYS REPLACE QUAD RING SEAL EACH TIME GAS CHECK VALVES ARE SERVICED.

## REPLACING FREEZE CYLINDER BEATER DRIVE SHAFT BEAR

(see Figures 3, 10, and 14)

### SHUTTING UNIT DOWN

1. Press ‘‘DEFROST’’ switch to defrost product in freeze cylinders.
2. After defrost cycle is completed, press ‘‘OFF 1’’ and ‘‘OFF 2’’ control switches to stop refrigeration system beaters motors.
3. Disconnect electrical power to Unit.
4. Remove back and side panels as instructed.
5. Close product shutoff valve leading from product blender tank to freeze cylinder beater drive shaft will be removed from.
6. Drain product from freeze cylinder.

### REMOVING BEATER DRIVE MOTOR AND BEATER DRIVE SHAFT ASS’Y FROM UNIT

1. Tag beater drive motor electrical wiring for identification, then disconnect wiring from motor terminal block on Unit frame.

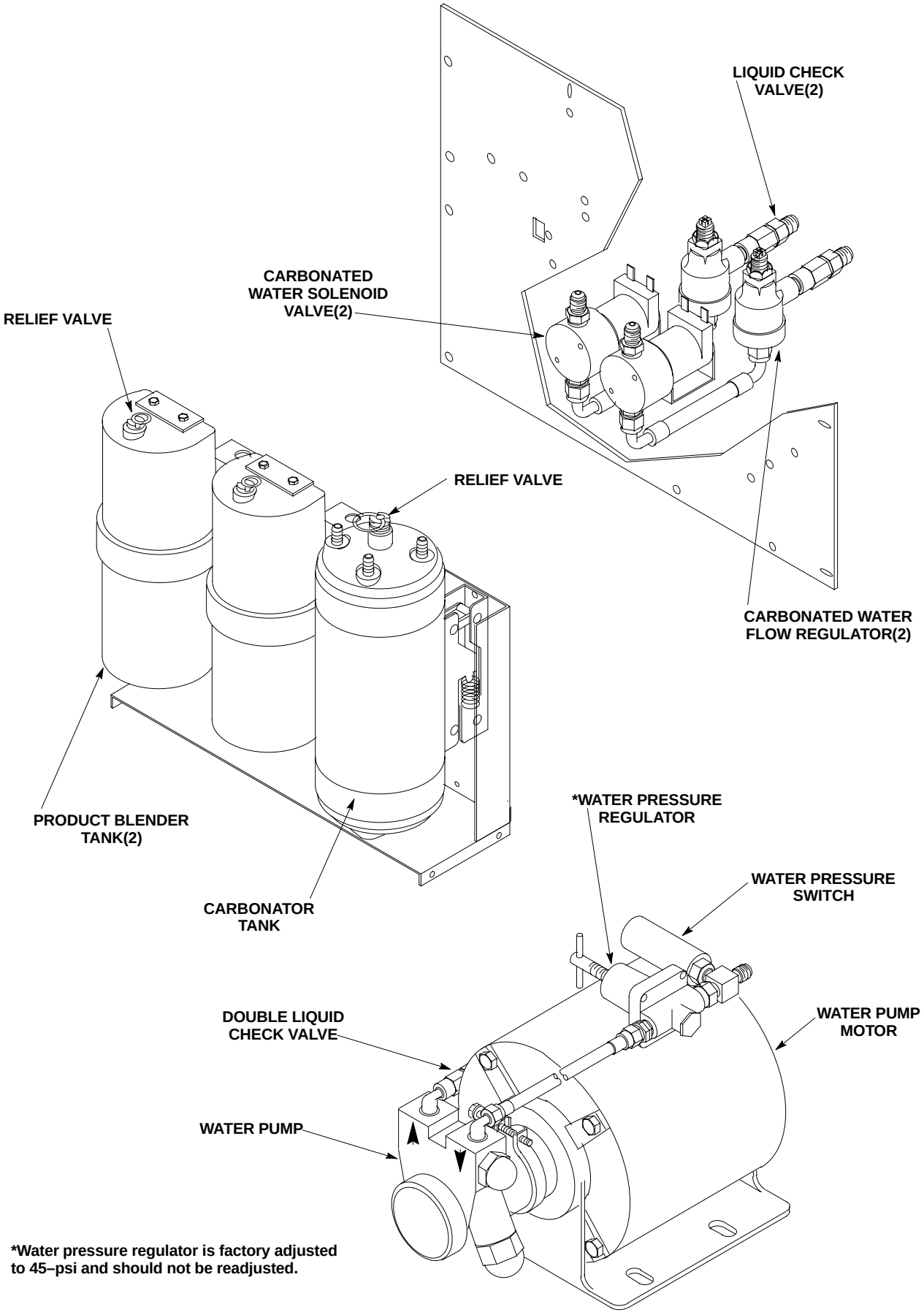



**FIGURE 12. WATER STRAINER SCREEN AND DOUBLE LIQUID CHECK VALVE**

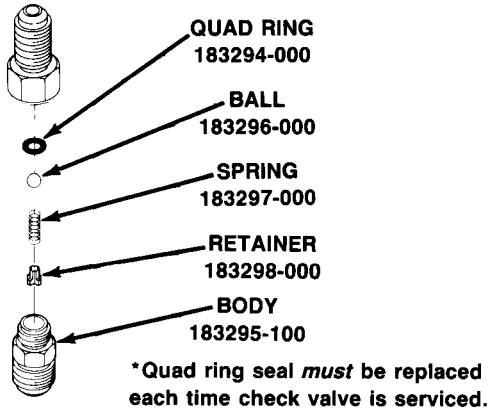



**FIGURE 13. $CO_2$ GAS CHECK VALVE**

2. Remove hex nuts and lockwashers securing beater drive motor to Unit frame.
3. Very carefully, remove beater drive motor from Unit. BE CAREFUL NOT TO LOSE PLASTIC COUPLER LOCATED BETWEEN BEATER DRIVE MOTOR SHAFT COUPLING AND BEATER DRIVE SHAFT ASSEMBLY COUPLING.

**NOTE: Items in parentheses are in reference to Figure 3.**

4. Remove HEX NUTS (item 7) and FLATWASHERS (item 6) securing FACEPLATE (item 8) to freeze cylinder, then remove faceplate.
5. Remove beater shaft and scraper blades from inside freeze cylinder.
6. Pull beater drive shaft seal assembly from socket in back of freeze cylinder using Cornelius Puller (P/N 322063-000).
7. Pull beater drive shaft assembly out back of freeze cylinder.

## INSTALLING BEATER DRIVE SHAFT BEARING ASS'Y

(see Figure 14)

**IMPORTANT: Bearing retaining collar has a special cam action that locks it up tightly against bearing inner race when properly installed. Cam-action type bearing retaining collar prevents bearing inner race from turning on beater drive shaft and prevents drive shaft from working in and out of freeze cylinder causing a knock when in operation.**

1. Loosen Allen-type setscrew securing bearing retaining collar on beater drive shaft. Rotate collar slightly to the left (counterclockwise) to unlock cam action from bearing inner race, then remove collar and bearing from shaft.
2. Remove boot from old bearing and install on new bearing.
3. Install new bearing, with boot in place, on beater drive shaft.
4. Install bearing retaining collar as follows:
   A. Slide bearing retaining collar up on beater drive shaft to bearing inner race.
   B. Rotate bearing retaining collar to the right (clockwise) so its cam action locks it securely against bearing inner race. When in locked position, its Allen-type setscrew *must* align with flat on beater drive shaft.

C. Tighten Allen-type setscrew to secure bearing retaining collar on beater drive shaft.

## INSTALLING BEATER DRIVE SHAFT ASS'Y AND BEATER DRIVE MOTOR ON UNIT

**NOTE: Use Beater Drive Shaft Assembly Alignment Tool Kit (P/N 0726) when installing beater drive shaft assembly.**

1. Lubricate beater drive shaft bearing boot with DOW-CORNING DC-111 (P/N 321471000) light grade silicone lubricant.
2. Install beater drive shaft assembly in freeze cylinder.
3. Place plastic power coupler in beater drive motor shaft coupling. TAPE POWER COUPLER TO MOTOR SHAFT COUPLING TO PREVENT COUPLER FROM FALLING OUT DURING INSTALLATION OF MOTOR IN UNIT.
4. *Very Carefully*, slide beater drive motor shaft through hole in Unit frame up to coupling on end of beater drive shaft assembly.
5. Engage plastic coupler, on end of beater drive motor shaft, in coupling on end of beater drive shaft assembly.
6. Secure beater drive motor to Unit frame with hex nuts and lockwashers.
7. Connect beater drive motor electrical wiring to motor terminal block on Unit frame.
8. Refer to DISPENSING VALVES CAGED O-RINGS AND BEATER DRIVE SHAFTS SEALS ASSEMBLIES under LUBRICATION and perform procedure to lubricate beater drive shaft seal assembly.
9. Carefully place shaft seal assembly over beater drive shaft and locate slots of seal retainer on drive shaft pin. Then, carefully and simultaneously push and turn plastic sleeve in notches of freeze cylinder retainer. When tabs are seated in notches, press assembly firmly in place.
10. Install beater shaft and scraper blades in freeze cylinder (see Figure 4).
11. Lubricate faceplate O-ring with water to facilitate installation, then install faceplate on Unit. Secure faceplate with hex nuts and lockwashers. DO NOT OVERTIGHTEN HEX NUTS.

## RESTORING UNIT OPERATION

1. Open product shutoff valve leading from product blender tank to freeze cylinder.
2. Connect electrical power to Unit.
3. Sanitize syrup system as instructed in CLEANING AND SANITIZING.
4. Press ‘‘AUTO BLEND 1’’ and ‘‘AUTO BLEND 2’’ to begin filling freeze cylinder. Open freeze cylinder faceplate relief valve to bleed air from cylinder while filling with product, then close valve. Do not relieve freeze cylinder pressure too fast or product will foam excessively in cylinder and lose carbonation.
5. Press ‘‘AUTO 1’’ and ‘‘AUTO 2’’ switches to start freeze cylinder and refrigeration system.
6. Check for leaks and repair if evident.
7. Install back and side panels by reversing removal procedure.
8. Install coupling on new beater drive motor shaft, then tighten Allen head setscrew securely. MAKE SURE COUPLING IS INSTALLED ON MOTOR SHAFT SAME DISTANCE AS NOTED IN STEP 7 preceding.

# REPLACING BEATER DRIVE SHAFT SEAL ASS'Y

(see Figures 3 and 14)

**NOTE: Use Beater Drive Shaft Assembly Alignment Tool Kit (P/N 0726) when installing beater drive shaft assembly.**

1. Refer to DISPENSING VALVES CAGED O-RINGS AND BEATER DRIVE SHAFTS SEALS ASSEMBLIES under LUBRICATION for instructions to replace beater drive shaft seal assembly.
2. Sanitize syrup system as instructed in CLEANING AND SANITIZING.

## REPLACING FREEZE CYLINDER BEATER DRIVE MOTOR

(see Figures 8 and 14)

1. Press ‘‘OFF 1’’ and ‘‘OFF 2’’ control switches to stop refrigeration system and beaters motors.
2. Disconnect electrical power from Unit.
3. Remove back and side panels as instructed.
4. Tag beater drive motor electrical wiring for identification, then disconnect wiring from motor terminal block on Unit frame.
5. Remove hex nuts and lockwashers securing beater motor drive to Unit frame.
6. Very carefully, remove old beater drive motor from Unit. BE CAREFUL NOT TO LOSE PLASTIC COUPLER LOCATED BETWEEN BEATER DRIVE MOTOR SHAFT COUPLING AND BEATER DRIVE SHAFT ASSEMBLY COUPLING.
7. Note how far beater drive motor shaft protrudes inside coupling. Using Allen wrench, loosen Allen head setscrew in coupling, then remove coupling from motor shaft.

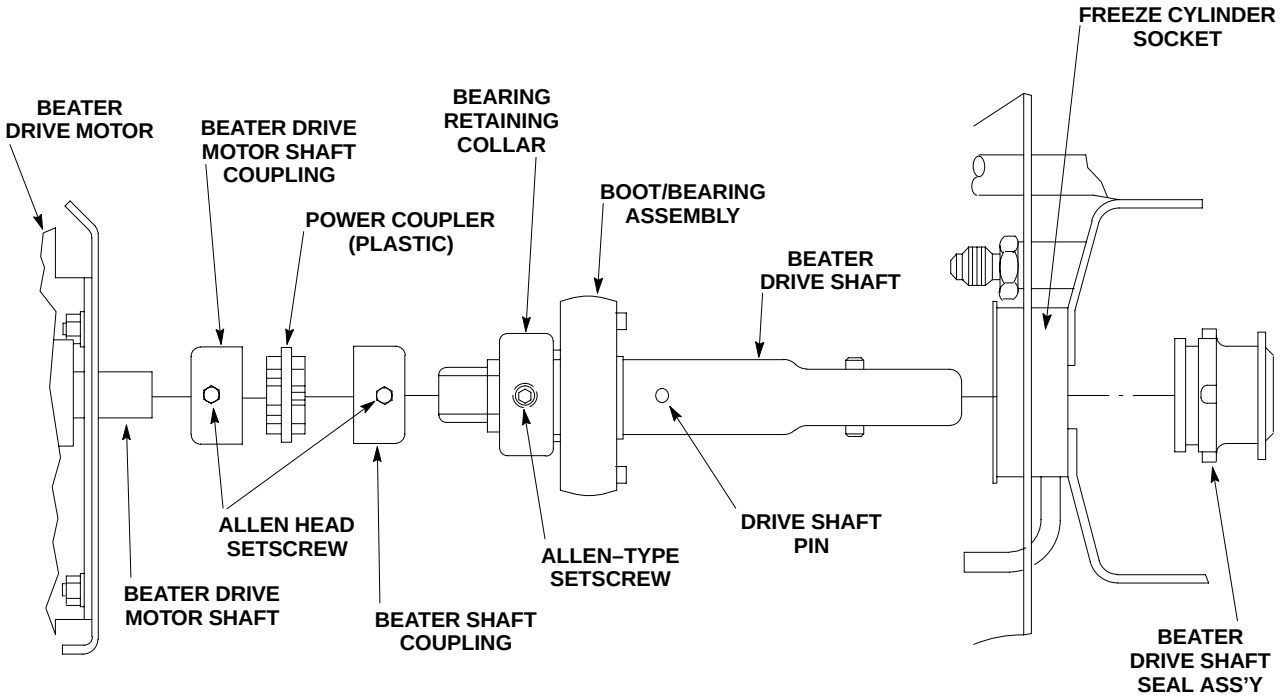



**FIGURE 14. BEATER DRIVE MOTOR AND SHAFT SEAL ASS’Y REPLACEMENT**

8. Install coupling on new beater drive motor shaft, then tighten Allen head setscrew securely. MAKE SURE COUPLING IS INSTALLED ON MOTOR SHAFT SAME DISTANCE AS NOTED IN STEP 7 PRECEDING.
9. Place plastic power coupler in beater drive motor shaft coupling. TAPE POWER COUPLER TO MOTOR SHAFT COUPLING TO PREVENT COUPLER FROM FALLING OUT DURING INSTALLATION OF MOTOR IN UNIT.
10. *Very carefully*, slide beater drive motor shaft through hole in Unit frame up to coupling on end of beater drive shaft assembly.
11. Engage plastic coupler, on end of beater drive motor shaft, in coupling on end of beater drive shaft assembly.

12. Secure beater drive motor to Unit frame with hex nuts and lockwashers.

13. Connect beater drive motor electrical wiring to motor terminal block on Unit frame.

**CAUTION: The new beater drive motor is provided with a gear box vent that is plugged with a hex-socket plug to prevent oil from leaking out of the gear box. After beater drive motor has been installed, remove hex-socket plug and install vent plug loose-shipped with beater drive motor.**

14. Remove hex-socket plug from vent hole in beater drive motor and install loose-shipped vent plug.

15. Install back and side panels.

16. Connect electrical power to Unit.

17. Press ‘‘AUTO BLEND 1’’ and ‘‘AUTO BLEND 2’’ control switches, then press ‘‘AUTO 1’’ and ‘‘AUTO 2’’ switches to start freeze cylinders beaters and refrigeration system.

## ADJUSTING CARBONATOR TANK LIQUID LEVEL

The carbonator tank liquid level (pump cut-in and cut-out) was adjusted at the factory and should require no further adjustment. However, if incorrect setting is suspected, check and make necessary adjustments as follows:

1. Remove Unit back and side panels as instructed for access to carbonator and carbonated water volume sample valve (see Figures 2 and 8).

2. To check carbonator tank total fill; allow carbonator water pump motor to operate and fill tank with carbonated water. After pump cycles off, disconnect electrical power from Unit.

3. Using container graduated in ounces, open carbonator carbonated water sample valve and completely drain carbonator tank into container. Total carbonated water volume dispensed should be 40 to 58-ounces maximum.

4. If total carbonated water dispensed is below 40-ounces, loosen screw securing level control switches actuator bracket (see Figure 15) and move actuator bracket up slightly. If more than 58-ounces, maximum of carbonated water was dispensed, move actuator bracket down, then tighten screw. MAKE ADJUSTMENTS IN SMALL INCREMENTS.

5. Connect electrical power to Unit and allow carbonator tank to fill with water and until water pump cycles off.

6. Repeat steps 2 through 5 preceding as many times as necessary until correct carbonated water volume adjustment is achieved.

7. To check differential; using container graduated in ounces, open carbonated water volume sample valve and dispense into container until carbonator water pump cycles on, then immediately close sample valve. Total volume dispensed (differential) should be 7 to 20-ounces.

8. Install back and side panels by reversing removal procedure.

9. Press ‘‘AUTO 1’’ and ‘‘AUTO 2‘’ switches to resume normal operation.

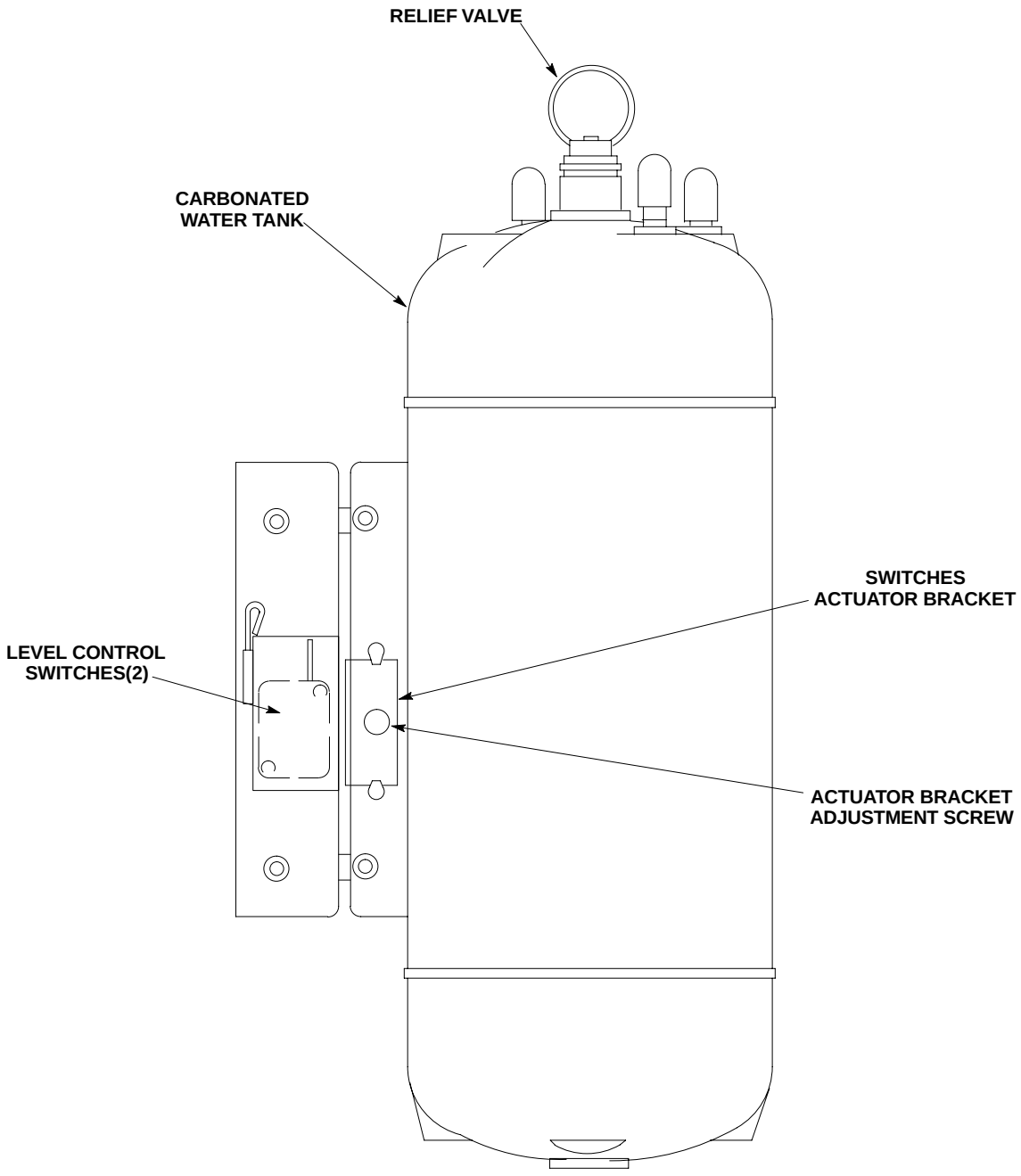



**FIGURE 15. CARBONATOR LIQUID LEVEL CONTROL SWITCH ADJUSTMENT**

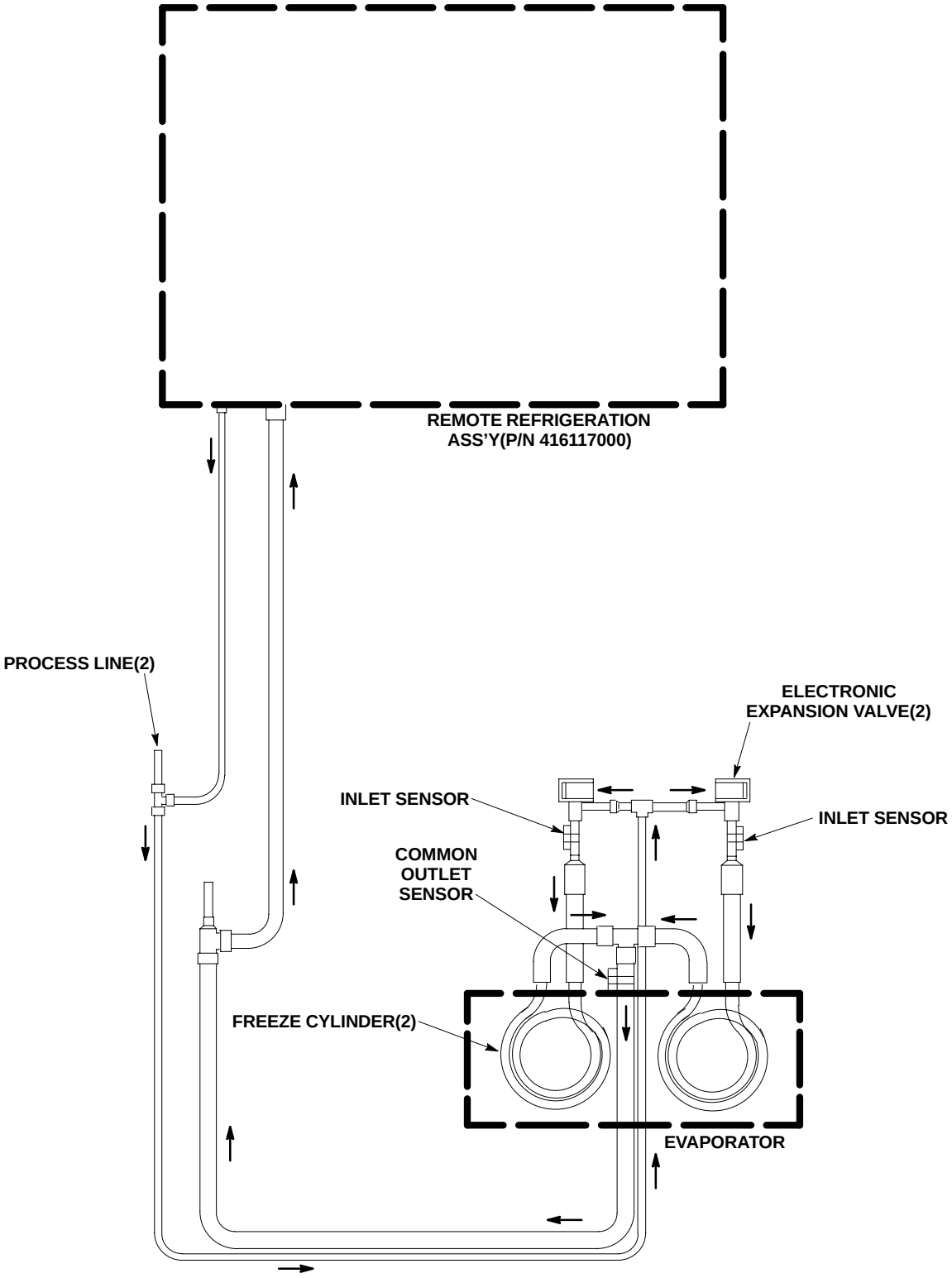



**FIGURE 16. REFRIGERATION FLOW DIAGRAM**

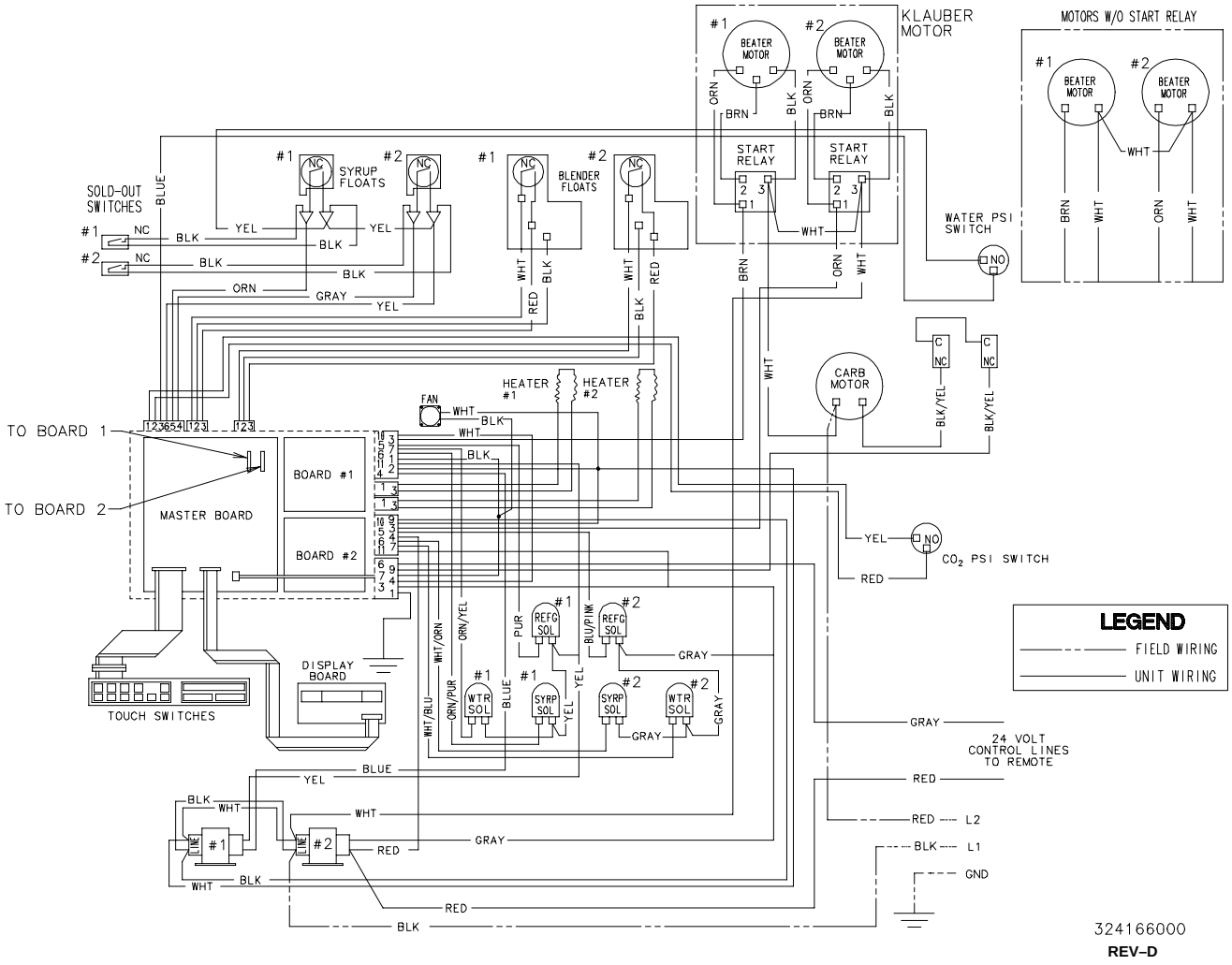



**FIGURE 17. WIRING DIAGRAM (FCB OVERCOUNTER DISPENSER)**

# TROUBLESHOOTING

**IMPORTANT: Only qualified personnel should service internal components or electrical wiring.**

**WARNING: If repairs are to be made to a product system, remove quick disconnects from the applicable product tank, then relieve the system pressure before proceeding. If repairs are to be made to the $CO_2$ system, stop dispensing, shut off the $CO_2$ supply, then relieve the system pressure before proceeding. If repairs are to be made to the refrigeration system, make sure electrical power is disconnected from the unit.**

**IMPORTANT: The following $CO_2$ and liquid disconnects disconnecting and connecting procedure for soft drink tank replacement or filling soft drink tank in place *must* be performed in order as follows:**

1. **To disconnect soft drink tank from Unit syrup system.**
   - **A. Disconnect liquid disconnect from soft drink tank. NOTE- Disconnecting liquid quick disconnect from soft drink tank first prevents syrup from backflowing through Unit syrup flow regulator which may alter regulator adjustment**
   - **B. Second, disconnect $CO_2$ quick disconnect from soft drink tank.**
2. **To connect soft drink tank into Unit syrup system.**
   - **A. First, connect $CO_2$ quick disconnect to soft drink tank to pressurize tank.**
   - **B. Second, connect liquid quick disconnect to soft drink tank.**

**TROUBLESHOOTING CONTROL PANEL SWITCHES AND FAULT MESSAGES**

| Trouble | Probable Cause | Remedy |
|---|---|---|
| ONE OR MORE CONTROL PANEL SWITCHES NOT OPERATING. | A. Flat cable not properly connected to control switch module or master circuit board. | A. Properly connect flat cable to control switch module or master circuit board. |
| | B. Flat cable connected between control switch module and master circuit board pinched and shorted out or broken wire in cable. | B. Check cable for pinched or broken wire condition and repair or replace as necessary. |
| | C. Inoperable switch(s) on control panel switch module. | C. Replace control panel switch module. |
| | D. Master circuit board not operating properly. | D. Replace master circuit board. |
| ALL CONTROL PANEL SWITCHES NOT OPERATING. | A. Electric power disconnected from Unit. | A. Restore electrical power to Unit. |
| | B. “SECURITY SWITCH” has not been pressed to activate control panel switches. | B. Press and hold “SECURITY SWITCH’’ for 3-seconds to restore control panel switches to operation. |
| | C. “SECURITY SWITCH” inoperable. (control switches deactivated). | C. Replace control panel switch module. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| ALL CONTROL PANEL SWITCHES NOT OPERATING (CONT"D). | D. Flat cable not properly connected to control switch module or master circuit board. | D. Properly connect flat cable to control switch module or master circuit board. |
| | E. Flat cable connected between control switch module and master circuit board pinched and shorted out or broken wire in cable. | E. Check cable for pinched or broken wire condition and repair or replace as necessary. |
| | F. Master circuit board not operating properly. | F. Replace master circuit board. |
| CONTROL PANEL SWITCHES CANNOT BE DEACTIVATED. | A. Not pressing and holding ''SECURITY SWITCH'' for 3-seconds to deactivate control switches | A. Press and hold ''SECURITY'' SWITCH'' for 3-seconds to deactivate control switches. |
| | B. ''SECURITY SWITCH'' inoperable. | B. Replace control panel switch module. |
| PARTIAL MESSAGE OR DULL (POORLY ILLUMINATED) DISPLAY. | A. Extremely low voltage. | A. Upgrade voltage. |
| ONE OR MORE FAULT MESSAGES NOT OPERATING. | A. Flat cable not properly connected to fault message module or master circuit board. | A. Properly connect flat cable to fault message module or master circuit board. |
| | B. Flat cable connected between fault message module and master circuit board pinched and shorted out or broken wire in cable. | B. Check cable for pinched or broken wire condition and repair or replace as necessary. |
| | C. External sensing device failing to signal master circuit board which in turn signals fault message display. | C. Replace or repair external sensing device. |
| | D. External sensing devices cable connectors not securely connected to master circuit board connectors. | D. Make sure external sensing devices cable connectors are securely connected to master circuit board connectors. |
| | E. Disconnected or broken wire between master circuit board connector and external sensing device. | E. Connect or repair wire between master circuit board connector and external sensing device. |
| | F. Master circuit board not operating properly. | F. Replace master circuit board. |
| | G. Fault message display module not operating properly. | G. Replace fault message display module. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| ALL FAULT MESSAGES NOT OPERATING | A. No electrical power to Unit. | A. Connect electrical power to Unit. |
| | B. Flat cable not properly connected to fault message module or master circuit board. | B. Properly connect flat cable to fault message module or master circuit board. |
| | C. Flat cable connected between fault message module and master circuit board pinched and shorted out or broken wire in cable. | C. Check cable for pinched or broken wire condition and repair or replace as necessary. |
| | D. Master circuit board no operating. | D. Replace master circuit board. |
| | E. Fault message display module not operating properly. | E. Replace fault message display module. |
| "$CO_2$ OUT" FAULT MESSAGE GOES ON DURING OPERATION. | A. $CO_2$ supply turned off or exhausted. | A. Open $CO_2$ cylinder shutoff valve or replenish $CO_2$ supply as instructed. |
| | B. Primary $CO_2$ regulator set too low. | B. Adjust primary $CO_2$ regulator as instructed. |
| | C. Inoperable $CO_2$ pressure switch. | C. Replace $CO_2$ pressure switch. |
| "$H_2O$ OUT" FAULT MESSAGE GOES ON DURING OPERATION. | A. Water supply turned off or water pressure inadequate | A. Turn on water supply or check water supply line pressure. |
| | B. Plugged water filter or water pump strainer screen. | B. Change water filter or clean water strainer as instructed. |
| | C. Inoperative water pressure switch. | C. Replace water pressure switch. |
| "SYRUP 1" OR "SYRUP 2" FAULT MESSAGE GOES ON DURING OPERATION. | A. Soft drink tank empty. | A. Replenish syrup supply as instructed. |
| "MOTOR 1" OR "MOTOR 2" FAULT MESSAGE GOES ON DURING OPERATION | A. Error within Unit has developed interrupting normal operation. | A. Locate and correct error, then press ERROR RESET" switch to restore normal operation. |
| EVAPORATOR COIL "SENSOR 1" OR 2" INLET OR COMMON OUTLET "SENSOR 3" FAULT MESSAGE GOES ON DURING OPERATION. | A. Inoperable "SENSOR" or electrical wires disconnected from "SENSOR". | A. Replace inoperable "SENSOR" or reconnect electrical wires to "SENSOR". |
| HEATER RL1 OR HEATER RL2 FAULT MESSAGE GOES ON DURING OPERATION. | A. Heater relay on relay circuit board not operating properly. | A. Replace relay circuit board. |
| "REFRIG" FAULT MESSAGE GOES ON DURING OPERATION. | A. Refrigeration system operates over thirty minutes and does not cycle off. | A. Refrigeration system problem. Call Serviceman. |
| "UNPLUG" FAULT MESSAGE GOES ON DURING OPERATION. | A. Error within Unit has developed interrupting normal operation. | A. Disconnect electrical power from Unit, then call Serviceman. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| FREEZE CYLINDER AUTOMATIC DEFROST CYCLE DOES NOT OPERATE. | A. Loosen or broken electrical wires. | A. Repair electrical wires. |
| | B. Inoperable automatic defrost timer. | B. Replace master circuit board. |
| UNIT DOES NOT GO OFF AUTOMATIC DEFROST CYCLE. | A. Automatic defrost timer stuck in automatic defrost cycle. | A. Replace master circuit board. |
| MANUAL DEFROST CYCLE DOES NOT OPERATE WHEN ‘‘DEFROST’’ SWITCH IS PRESSED | A. Flat cable not properly connected to control switch module or master circuit board. | A. Properly connect flat cable to control switch module or master circuit board. |
| | B. Flat cable connected between control switch module and master circuit board pinched and shorted out or broken wire in cable. | B. Check cable for pinched or broken wire condition and repair or replace as necessary. |
| | C. Inoperable ‘‘DEFROST’’ switch on control panel switch module. | C. Replace control panel switch module. |
| | D. Loose or broken wire. | D. Repair wire. |
| | E. Master circuit board not operating properly. | E. Replace master circuit board. |
| DEFROST CYCLE DOES NOT CANCEL AFTER PRESSING ‘‘CANCEL DEFROST SWITCH’’ | A. Flat cable not properly connected to control switch module or master circuit board. | A. Properly connect flat cable to control switch module or master circuit board. |
| | B. Flat cable connected between control switch module and master circuit board pinched and shorted out or broken wire in cable. | B. Check cable for pinched or broken wire condition and repair or replace as necessary. |
| | C. Inoperable ‘‘CANCEL DEFROST’’ switch on control panel switch module. | C. Replace control panel switch. |
| | D. Master circuit board not operating properly. | D. Replace master circuit board. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| **TROUBLESHOOTING PRODUCT BLENDER TANKS AND CARBONATOR** | | |
| CARBONATOR WATER PUMP MOTOR WILL NOT OPERATE. | A. No electrical power to Unit. | A. Connect electrical power to Unit. Check power source. |
| | B. “AUTO BLEND 1” or “AUTO BLEND 2” switches have not been pressed. | B. Press “AUTO BLEND 1” or “AUTO BLEND 2” switch. |
| | C. “$H_2O$ OUT” fault message is on. | C. Restore water supply to Unit. |
| | D. “$CO_2$ OUT” fault message is on. | D. Replenish $CO_2$ supply as instructed. |
| | E. Loosen or broken electrical wires. | E. Tighten connections or replace wires. |
| | F. Overheated water pump motor cut off by overload protector. | F. Check for proper line voltage. Check restricted pump discharge. |
| | G. Binding water pump (new or replacement pump only.) | G. Remove water pump from motor. Rotate pump coupling shaft 180 degrees, then reinstall pump. |
| | H. Inoperative water pump and/or motor. | H. Replace pump and/or motor. |
| | I. Inoperative carbonated water tank level control switches. | I. Replace level control switches. |
| | J. Binding, damaged, or dirty carbonated water tank balance mechanism. | J. Clean, repair, or replace balance mechanism. |
| | K. Inoperative water pump and/or motor. | K. Replace water pump and/or motor. |
| CARBONATOR WATER PUMP WILL NOT SHUT OFF. | A. Binding, damaged, or dirty carbonated water tank balance mechanism. | A. Clean, repair, or replace balance mechanism. |
| ERRATIC CARBONATOR WATER PUMP CYCLING. | A. Insufficient water supply pressure. ”$H_2O$ OUT” fault message goes on and off intermittently and water pump cycles on and off during carbonator tank fill cycle. | A. Increase water inlet supply line pressure. Water inlet supply line must have large enough I.D. |
| | B. Water filter restricted | B. Replace water filter. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| **TROUBLESHOOTING DISPENSED PRODUCT** | | |
| BRIX (WATER-TO-SYRUP) ‘‘RATIO’’ TOO LOW. | A. Quick disconnect not secure on soft drink tank. | A. Secure tank quick disconnect. |
| | B. Syrup flow regulator set too low. | B. Adjust BRIX of dispensed product as instructed. |
| | C. Water flow regulator set too High. | C. Water flow regulator must be set at 1.5 ± 0.05 oz/sec. |
| | D. Syrup flow regulators stuck. | D. Clean syrup flow regulators. |
| | E. Restriction in syrup line. | E. Sanitize Unit as instructed. |
| | F. Syrup Baume not in proper range. | F. Change syrup supply as instructed. |
| BRIX (WATER-TO-SYRUP) ‘‘RATIO’’ TOO HIGH. | A. Syrup flow regulators set too high. | A. Adjust BRIX of dispensed product as instructed. |
| | B. Water flow regulator set too low. | B. Water flow regulator must be set for 1.5 ± 0.05 oz/sec. |
| | C. Water flow regulator stuck. | C. Clean regulator. |
| | D. Syrup Baume not in proper range. | D. Change syrup supply as instructed. |
| | E. Restricted water filter. | E. Replace water filter. |
| IMPROPER PRODUCT DISPENSED. | A. Secondary $CO_2$ regulators not properly adjusted. | A. Adjust secondary $CO_2$ regulators as instructed. |
| | B. Dirty $CO_2$ supply. $CO_2$ must be clean and free of water, oil, and dirt. Water will not absorb dirty $CO_2$ gas in same way as clean gas. This can also cause off taste problems. | B. Replace $CO_2$ supply as instructed. |
| PRODUCT WILL NOT DISPENSE OUT OF DISPENSING VALVE, IN ONLY SMALL AMOUNTS, OR ONLY LIQUID. | A. Dispensing valve has ice particles in it. | A. Open and close dispensing valve repeatedly. Defrost freeze cylinder as instructed. If necessary, check and adjust BRIX as instructed. Adjust viscosity of dispensed product as instructed |
| | B. Cylinder freeze-up. | B. Refer to CYLINDER FREEZE-UP. |
| FREEZE CYLINDER DOES NOT REFILL AT ALL TIMES WHEN DISPENSING. | A. ‘‘AUTO BLEND 1’’ or ‘‘AUTO BLEND 2’’ switch not pressed. | A. Press ‘‘AUTO BLEND 1’’ or ‘‘AUTO BLEND 2’’ switch. |
| | B. Carbonator water pump not operating. | B. Check carbonator and restore to operation. |
| | C. Lines restricted. | C. Sanitize Unit as instructed. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| FROZEN PRODUCT CONSISTENCY VARIES EXCESSIVELY. | A. Dispensed product BRIX varying because: Syrup and/Or water flow regulator sticking. | A. Clean regulator(s). |
| | B. Dispensed product BRIX varying because: Primary $CO_2$ regulator pressure insufficient. | B. Primary $CO_2$ regulator must be adjusted from 80 to 100-psi. |
| | C. Cylinder freeze-up causing ice formation in center of cylinder and liquid product channels around ice formation<br><br>**NOTE: Defrost affected cylinder as instructed.** | C. Refer to CYLINDER FREEZE-UP. |
| CYLINDER FREEZE-UP. | A. Dispensed product BRIX too low. | A. Refer to BRIX (Water-to-Syrup) ‘‘Ratio” too low. |
| | B. Viscosity of dispensed product not properly adjusted. | B. Adjust dispensed product viscosity as instructed. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| **TROUBLESHOOTING REMOTE REFRIGERATION ASSEMBLY** | | |
| **NOTE: Refer to manual provided with the Remote Refrigeration Assembly for troubleshooting refrigeration assembly.** | | |

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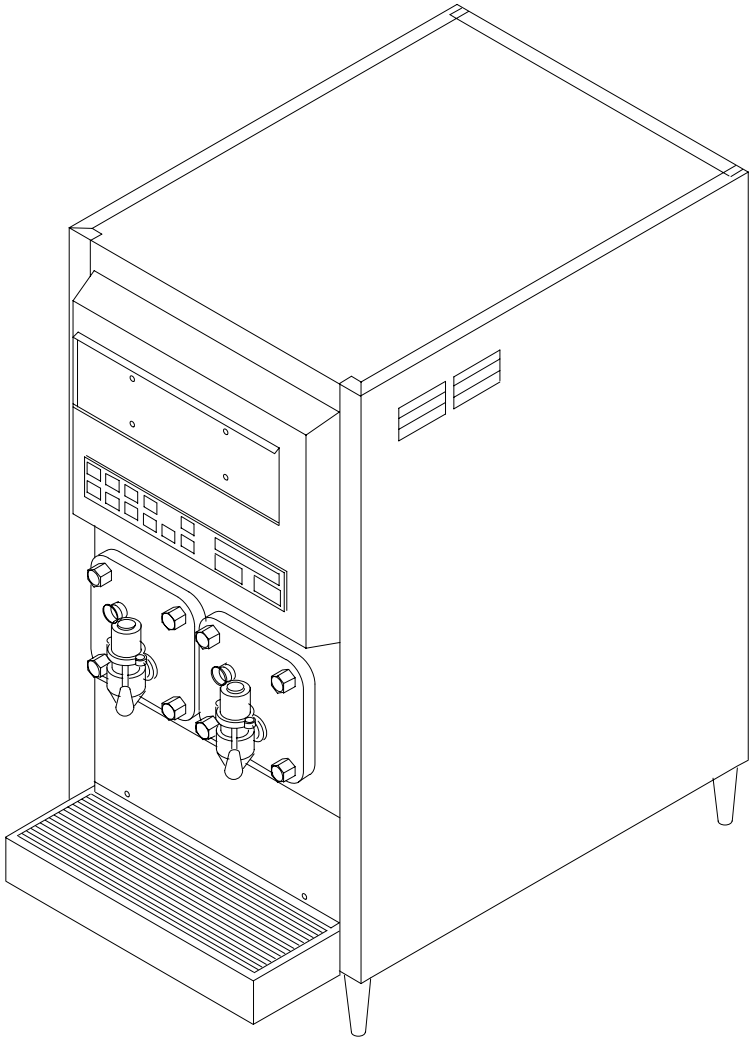
# FCB OVERCOUNTER POST-MIX DISPENSER

## WITH V3 ELECTRONICS

**MODEL NO:**

**416116-xxx**
**496116-xxx**



ILLUSTRATED PARTS BREAKDOWN

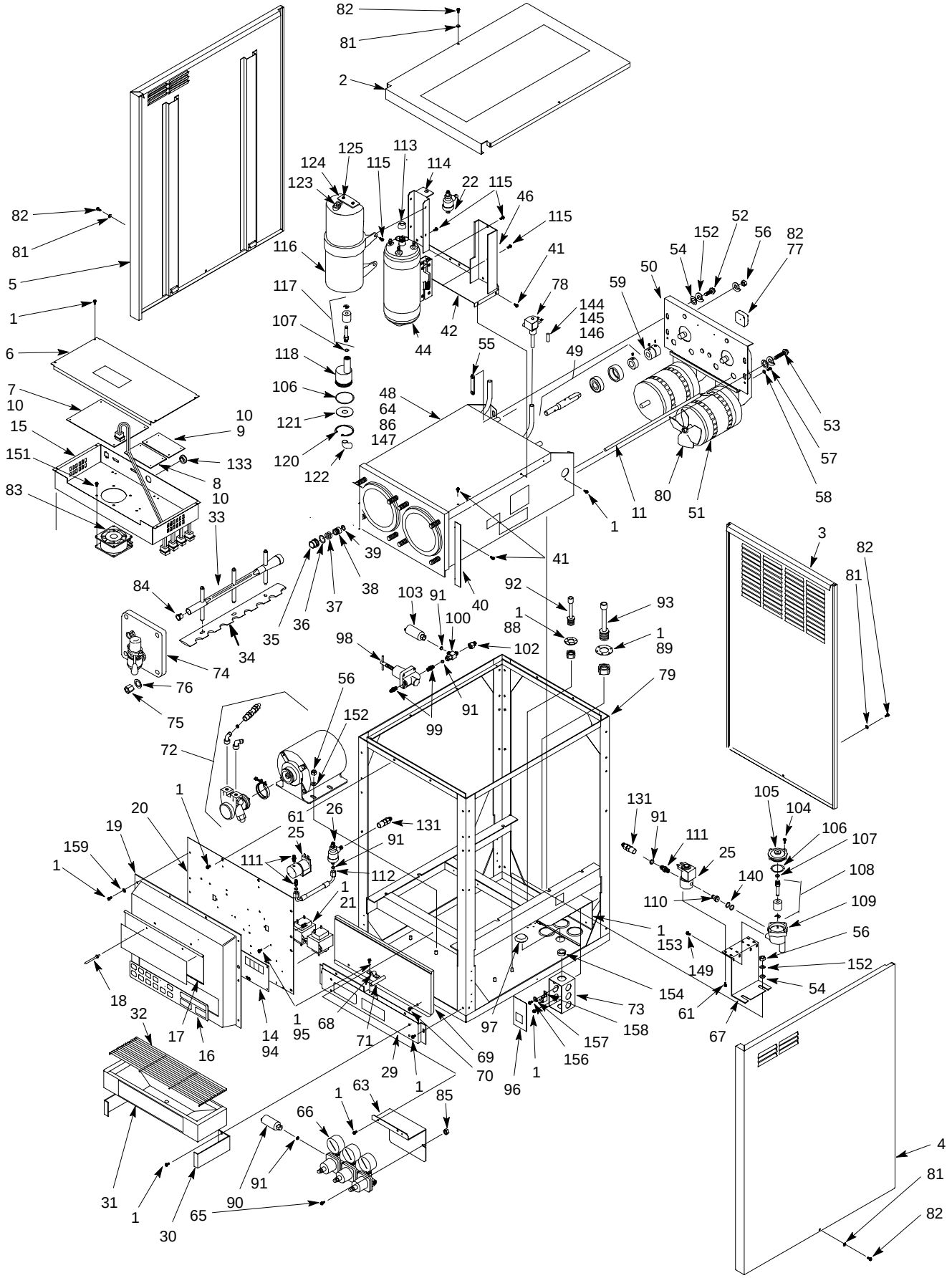



**FIGURE 18. OVERCOUNTER FCB (EVAPORATOR UNIT)**

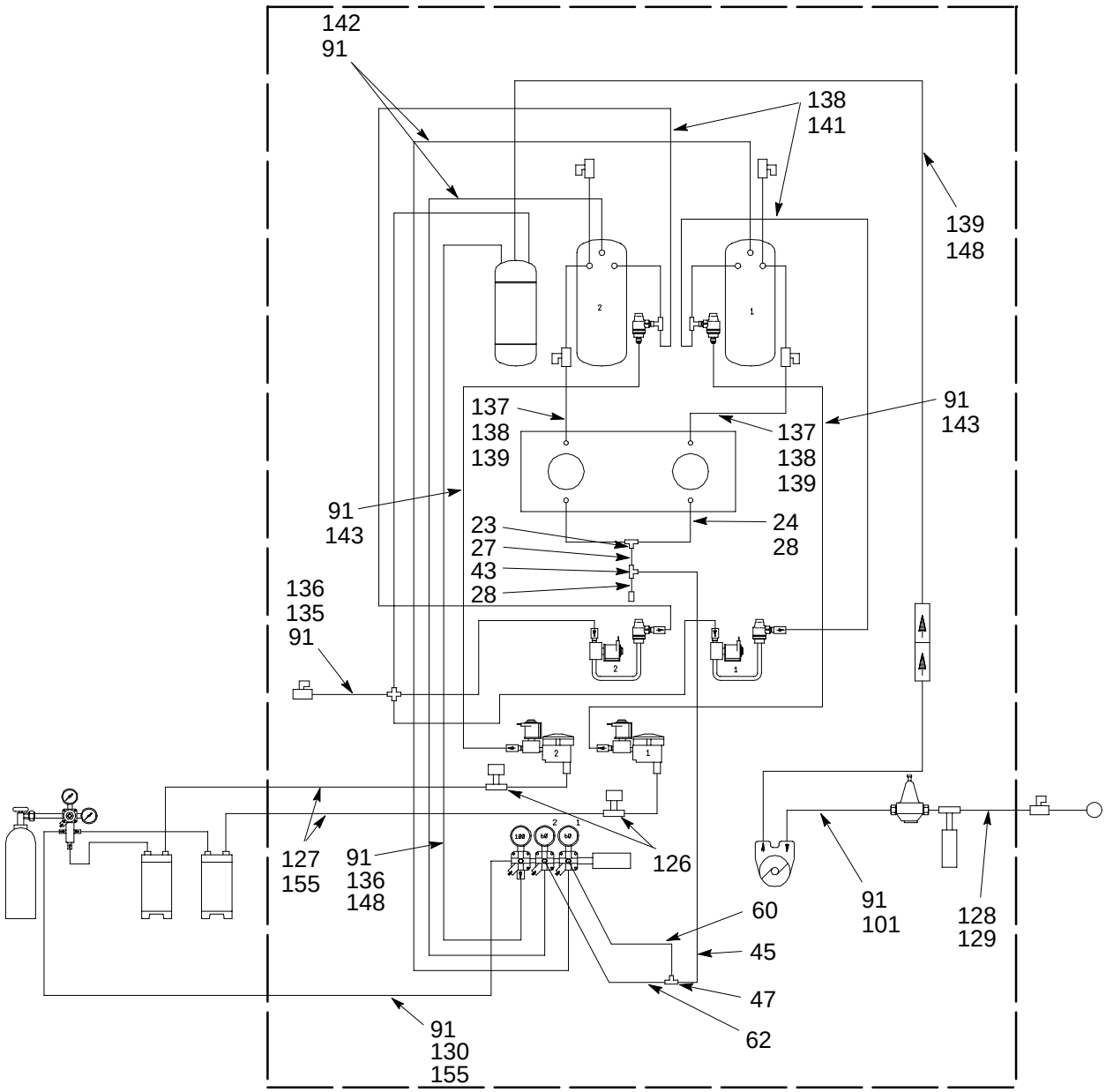



**FIGURE 19 (CON'T) PLUMBING DIAGRAM**

# OVERCOUNTER FCB (EVAPORATOR UNIT)

| Item | Part | Description |
|---|---|---|
| | 416116-xxx | Overcounter FCB, 115V 60HZ |
| | 496116–xxx | Overcounter FCB, 230V 50HZ |
| 1 | *319941 | Thread Rolling Screw, SL Hex Washer Hd, No. 8-32 by 3/8-in. Long |
| 2 | 324125-068 | Panel, Top |
| 3 | 324126-068 | Panel, Back |
| 4 | 324127-068 | Panel, Side, Right-Hand |
| 5 | 324128-068 | Panel, Side, Left-Hand |
| 6 | 325767 | Cover, Control Box |
| 7 | 324136-xxx | Board, Master |
| 8 | 324137 | Board, Motor No. 1 |
| 9 | 324138 | Board, Motor No. 2 |
| 10 | 325925 | Support, Board (not shown) |
| 11 | 324182 | Heater Cartridge |
| 12 | 325998 | Cable Ribbon (not shown) |
| 13 | 326079 | Cable Ribbon (not shown) |
| 14 | 326078 | Board, Display |
| 15 | 324184 | Control Box |
| 16 | 325962-040 | Switch, Touch |
| 17 | 325981-069 | Holder, Flavor Tab |
| 18 | 189955 | Rivet |
| 19 | 325740-039 | Cover, Switch |
| 20 | 324134-073 | Plate, Back |
| 21 | 319739 | Transformer, 230-24 |
| 22 | 310198-133 | Flow Regulator, Syrup (see FIGURE 19) |
| 23 | 324244 | Fitting, Tee Barbed for .312 I.D. Tube (see Plumbing Diagram) |
| 24 | 311908 | Clamp, for .437 O.D. Tube (see Plumbing Diagram) |
| 25 | 325742 | Solenoid Valve, Carb. Water |
| 26 | 310757 | Flow Regulator, Water (see FIGURE 19) |
| 27 | **140594 | Tube, .312 I.D. by 16-in. Long (see Plumbing Diagram) |
| 28 | **140594 | Tube, 312 I.D. by 6-in. Long (see Plumbing Diagram) |
| 29 | 324133-069 | Support, Drip Tray |
| 30 | 325723 | Bracket, Drip Tray |
| 31 | 317659-029 | Drip Tray |
| 32 | 317660 | Cup Rest |
| 33 | 2353 | Body, Beater |
| 34 | 325457 | Blade, Scraper |
| 35 | 320550 | Sleeve, Nylon |
| 36 | 320815 | O-Ring, 1.234 I.D. by .139 C.S. |
| 37 | 320533 | O-Ring, .859 I.D. by .139 C.S. |
| 38 | 320808 | Retainer, Seal |
| 39 | 320814 | O-Ring, .734 I.D. by .139 C.S. |
| 40 | 325701 | Extension, Foam Pack |
| 41 | *325282 | Self-Drilling Screw, Hex Washer HD, No. 8-18 by 1/2-in. Long |

| Item | Part | Description |
|---|---|---|
| 42 | 324123 | Support, Carbonator and Blender |
| 43 | 300393 | Tee (see Flow Diagram) |
| 44 | 326136 | Tank and Linkage Ass'y (see FIGURE 20) |
| 45 | **174058 | Tube, .156 I.D. by 11-in. Long (see Plumbing Diagram) |
| 46 | 324129 | Support, Carbonator |
| 47 | 317528 | Tee, 1/8 Barb (see Plumbing Diagram) |
| 48 | 324121 | Foam Pack Ass'y |
| 49 | 326014 | Drive Shaft Ass'y (see FIGURE 21) |
| 50 | 324132 | Mount, Motor, 115V 60HZ |
| | 0598 | Mount, Motor, 230V 50HZ |
| 51 | 324120 | Motor, 115V 60HZ |
| | 2108 | Motor, 230V 50HZ |
| 52 | *320899 | Cap Screw, Hex HD, 5/16-18 by 3/4-in. Long |
| 53 | *186144 | Cap Screw, Hex HD, 5/16-18 by 1/2 1-1/4-in. Long. |
| 54 | *320737 | Washer, .343 I.D. |
| 55 | 320604 | Twin Nut, 5/16-18 |
| 56 | *186146 | Hex Nut, 5/16-18, Stainless Steel |
| 57 | *320940 | Self-Drilling Screw, Hex Washer HD, No. 10. by 5/8-in. Long |
| 58 | *343304 | Lock Washer, No. 10 |
| 59 | 325937 | Coupling Shaft |
| 60 | **174058 | Tube, .156 I.D. by 1-in Long (see Plumbing Diagram) |
| 61 | *320734 | Machine Screw, Phil Pan HD, No. 6-32 by 3/8-in. Long |
| 62 | *174058 | Tube, .156 I.D. by 3-in. Long (see Plumbing Diagram) |
| 63 | 325725 | Bracket, Regulators |
| 64 | *189429 | Hex Nut, 1/4-20 |
| 65 | 186770 | Machine Screw, Phil RD HD, No. 10-24 by 5/8-in. Long |
| 66 | 326097 | Regulator Ass'y (see FIGURE 22) |
| 67 | 324124 | Bracket, Float |
| 68 | 320776 | Strap, Tube |
| 69 | 325726 | Access Panel |
| 70 | 150918 | Machine Screw, SL Truss HD, Stainless Steel No. 8-32 by 3/8-in. Long |
| 71 | 320754 | Drain Tube, Stainless Steel |
| 72 | 324157 | Pump and Motor Ass'y,115V 60HZ (see FIGURE 23) |
| | 2114 | Pump and Motor Ass'y, 230V 50HZ (see FIGURE 23) |
| 73 | 343606 | Electrical Box |
| 74 | 326106 | Door Ass'y (see FIGURE 25) |
| 75 | 320553-001 | Hex Nut, 7/16-14 |
| 76 | 320916 | Washer, .450 I.D. |
| 77 | 324171 | Relay, Start, 115V 50HZ |
| 78 | 326071 | Solenoid Valve |
| 79 | 324122-068 | Frame |
| 80 | 324199 | Fan, 115V 50HZ |
| 81 | *322967 | Washer, No. 6 |

# OVERCOUNTER FCB (EVAPORATOR UNIT) (CON'T)

| Item | Part | Description |
|---|---|---|
| 82 | 320106 | Thread Rolling Screw, Phil Pan HD, No. 6-32 by 1-in. Long |
| 83 | 0150 | Fan, Control Box |
| 84 | 2392 | Bushing, Split |
| 85 | *398024-603 | Hex Nut, No. 10-24 |
| 86 | 318418 | Washer, .250 I.D. |
| 87 | 324252 | Leg (not shown) |
| 88 | 309919 | Flange |
| 89 | 309920 | Flange |
| 90 | 325776 | Pressure Switch, CO |
| 91 | 178025-100 | Tapered Gasket, White |
| 92 | 309914-011 | Coupling |
| 93 | 309913-011 | Coupling |
| 94 | 325957 | Support, P.C. Board |
| 95 | 200498-003 | Hex Nut, No. 8-32 |
| 96 | 313102 | Cover, Electrical Box |
| 97 | 321818 | Plug |
| 98 | 311367 | Pressure Regulator, Water |
| 99 | 183061 | Fitting, 1/4NPT by 7/16-20 |
| 100 | 770687 | Fitting Tee 7/16-20 |
| 101 | 324212 | Tube Ass'y (see Plumbing Diagram) |
| 102 | 770716-020 | Fitting, 7/16 Female by 5/8-18 (see Plumbing Diagram) |
| 103 | 325777 | Pressure Switch, Water |
| 104 | 343487 | Machine Screw, Phil Pan HD, No. 8-32 by 1/2-in. Long |
| 105 | 315916 | Cover, Float |
| 106 | 315925 | O-Ring, 1.609 I.D. by .139 C.S. |
| 107 | 315931 | O-Ring, .364 I.D. by .070 C.S. |
| 108 | 325170 | Switch, Float Ass'y |
| 109 | 315915 | Body, Float |
| 110 | 324227 | Connector, Solenoid |
| 111 | 770750-010 | Fitting, 1/4-NPT by 7/16-20 |
| 112 | 326130 | Tube Ass'y |
| 113 | 317974 | Deflector, Relief Valve |
| 114 | 325507 | Bracket, Tank |
| 115 | *188206 | Thread Rolling Screw, Phil Truss HD, No. 10-24 by 3/4-in. Long |
| 116 | 324047 | Blender Ass'y |
| 117 | 325288 | Switch, Float Ass'y (see FIGURE 27) |
| 118 | 324048 | Holder, Switch |
| 119 | 325686 | Wire Harness Carb. (not shown) |
| 120 | 324115 | Retaining Ring |
| 121 | 324116 | Washer, .625 I.D. |
| 122 | 186570 | Strain Relief |
| 123 | 326105 | Relief Valve |
| 124 | 311743 | Retainer, Blender |
| 125 | *311751 | Machine Screw, SL Hex HD No. 4-40 by 1/4-in Long |

| Item | Part | Description |
|---|---|---|
| 126 | 326111 | Sold Out Switch Ass'y (see Flow Diagram) |
| 127 | 2815 | Tube Ass'y (see Flow Diagram see FIGURE 27) |
| 128 | 176272-396 | Tube Ass'y (see Flow Diagram see FIGURE 27) |
| 129 | 311304 | Tapered Gasket, Black (see Flow Diagram) |
| 130 | 174061-196 | Tube Ass'y (see Flow Diagram; see FIGURE 27) |
| 131 | 311764-001 | Check Valve Ass'y (see Figure 24) |
| 132 | 2340 | Wire Harness, Input (not shown) |
| 133 | 320389 | Snap Bushing |
| 134 | 324135 | Wire Harness, Main (not shown) |
| 135 | 324169 | Tube Ass'y (see Plumbing Diagram; see FIGURE 27) |
| 136 | 309854 | Clamp, .409 O.D. Tube (see Plumbing Diagram) |
| 137 | 178025-200 | Tapered Gasket, Red (see Plumbing Diagram) |
| 138 | 325576 | Syphon Tube (see Plumbing Diagram) |
| 139 | 1578 | Tube Ass'y (see Plumbing Diagram; see FIGURE 27) |
| 140 | 183008 | O-Ring, .489 I.D. by .070 C.S. |
| 141 | 324142 | Tube Ass'y (see Plumbing Diagram; see FIGURE 27) |
| 142 | 326098 | Tube Connector (see Plumbing Diagram) |
| 143 | 324141 | Tube Connector (see Plumbing Diagram) |
| 144 | 326073-011 | Thermostat |
| 145 | 309338-012 | Clip, Sensor |
| 146 | 309338-011 | Clip, Sensor |
| 147 | 011117 | Clip, Wire |
| 148 | 325558 | Tube Ass'y (see Plumbing Diagram; see FIGURE 27) |
| 149 | 186150 | Machine Screw, Phil Pan Hd, No. 8-32 By 3/8-In. Long |
| 150 | 326002 | Drain Kit, Drip Tray (not shown) |
| 151 | *312251 | Thread Rolling Screw, Phil Pan HD, No. 10-24 by 3/8-in. Long |
| 152 | *343313 | Washer, 3 R.I.D. by .030 C.S. |
| 153 | 324234 | Guard, Splash |
| 154 | 3231 | Strain Relief |
| 155 | 176193 | Fitting, 7/16-20 (see Plumbing Diagram) |
| 156 | *325069 | Machine Screw, SL Hex HD, No.10-24 by 1/2-in. Long |
| 157 | 325145 | Washer, No. 10 |
| 158 | 325644 | Lug, Ground |
| 159 | 188346 | Washer, .192 I.D. |
| 160 | 1019 | Wire Harness (Not Shown) |

*Zinc-plated steel unless indicated otherwise
**Sold in bulk quantity

**CAUTION**
**ITEMS 6 AND 7 ARE**
**A MATCHED SET**
**DO NOT REPLACE SEPARATELY**
**FOR SYRUP FLOW REGULATOR**
**USE SLEEVE AND PISTON ASS'Y**
**P/N 315553000**
**FOR**
**WATER FLOW REGULATOR**
**USE SLEEVE AND PISTON ASS'Y**
**P/N 313437000**

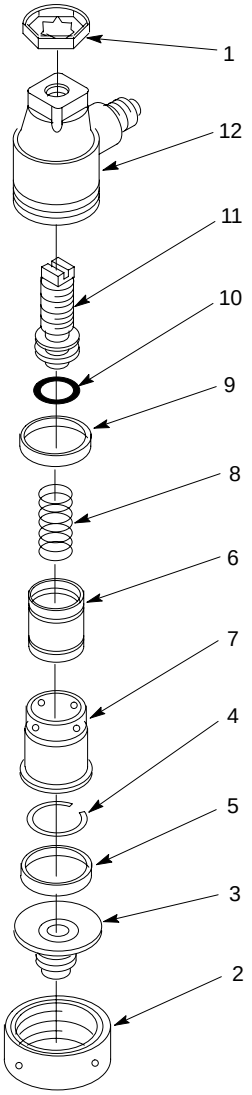



**FIGURE 19. FLOW REGULATOR ASSEMBLY**

| Item | Part | Description |
|---|---|---|
| | 310198-133<br>310757 | Flow Regulator Ass'y, Syrup<br>Flow Regulator Ass'y Water |
| 1 | 310477 | Lock Nut, 7/16 |
| 2 | 310488 | Coupling Nut |
| 3 | 310483 | Fitting, Inlet |
| 4 | 311509 | Ring, Expansion |
| 5 | 311236 | Quad Ring |
| 6 | 310755 | Sleeve |

| Item | Part | Description |
|---|---|---|
| 7 | | Piston (used on Syrup Flow Regulator) Piston (used on Water Flow Regulator) |
| 8 | 310482 | Spring |
| 9 | 313657 | Quad Ring, .03.612 I.D. by .03.103 C.S. |
| 10 | 180025 | O-Ring |
| 11 | 310632 | Adjusting Screw |
| 12 | 318936-033<br>318936-039 | Body, Syrup Regulator<br>Body, Water Regulator |

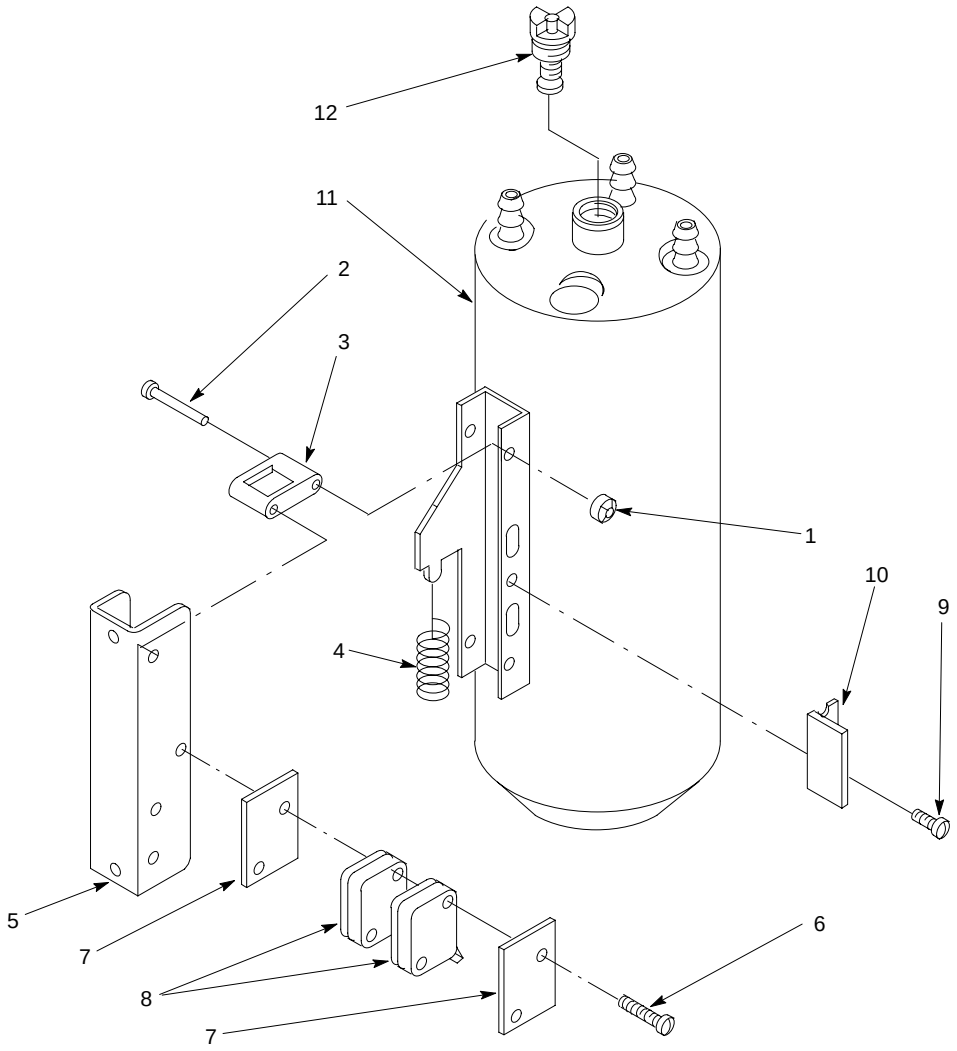



**FIGURE 20. CARBONATOR TANK AND LINKAGE ASSEMBLY**

| Item | Part | Description |
|---|---|---|
| | 326136 | Carbonator Tank and Linkage Ass'y |
| 1 | 318036 | Push-On Nut |
| 2 | 317772 | Pin |
| 3 | 317746 | Link, Pivot |
| 4 | 317752 | Spring |
| 5 | 317747 | Pivot Housing |
| 6 | *315961 | Machine Screw, SL RD HD, No. 4-40 by 1-1/8-in. Long |

| Item | Part | Description |
|---|---|---|
| 7 | 318037 | Insulation Switch |
| 8 | 317771 | Level Control Switch |
| 9 | *342663 | Thread Cutting Screw, Phil Pan HD,Sems No. 8-32 by 3/8-in. Long |
| 10 | 318123 | Switch, Actuator |
| 11 | 326135 | Tank, Carbonator |
| 12 | 318362 | Relief Valve |

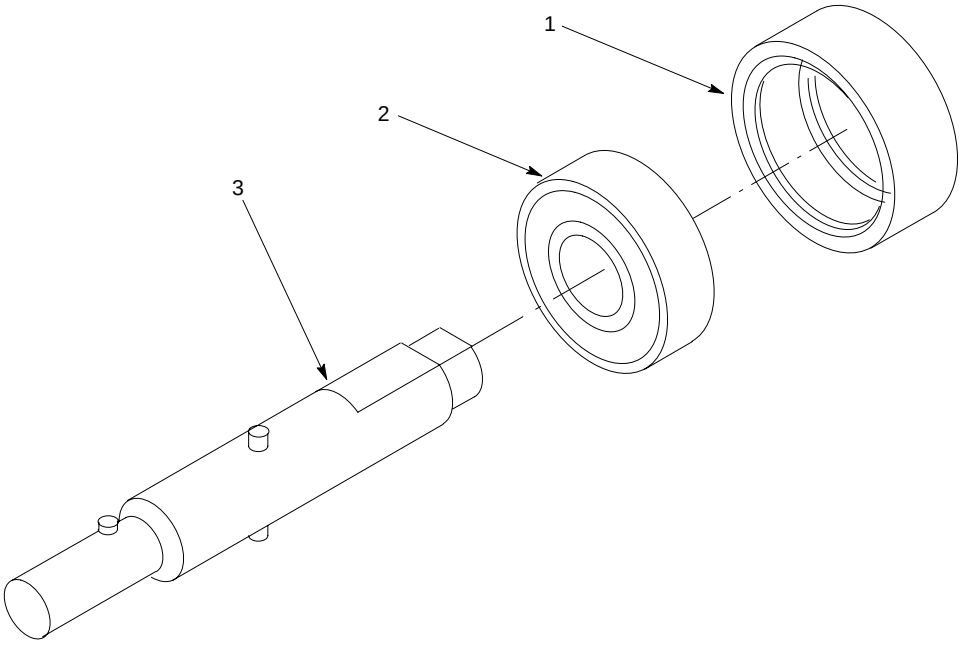



**FIGURE 21. DRIVE SHAFT ASSEMBLY**

| Item | Part | Description |
|---|---|---|
| | 326014-088 | Drive Shaft Ass'y |
| 1 | 325291 | Boot, Rubber |

| Item | Part | Description |
|---|---|---|
| 2 | 324233 | Bearing |
| 3 | 326013 | Shaft Ass'y |

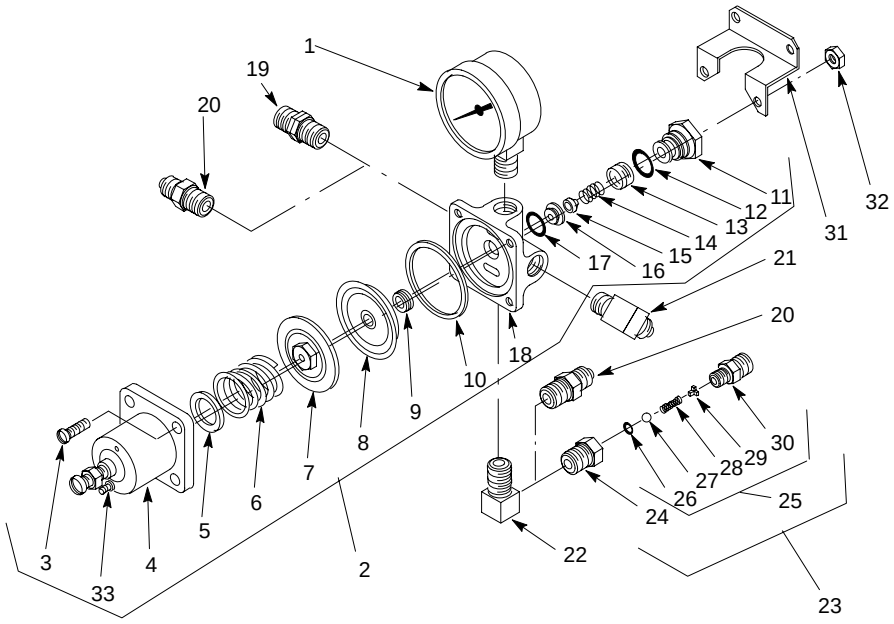



**FIGURE 22. $CO_2$ REGULATOR ASSEMBLY**

| Item No. | Part No. | Name |
|---|---|---|
| | 326097 | $CO_2$ Regulator Ass'y and Bracket, Secondary (2-Flavor) |
| 1 | 183287 | Gage, 60-PSI |
| | 183286 | Gage, 100-PSI |
| 2 | 183449 | $CO_2$ Regulator Ass'y, 60-PSI, Orange (Includes 3-18) |
| | 183412 | $CO_2$ Regulator Ass'y, 100-PSI, Gold (Includes 3-18) |
| 3 | 183040 | Machine Screw, Phil Fill Hd., No. 10-32 By 7/8-In. Long |
| 4 | 183233-059 | Cover Kit (Includes Nonremovable Adjusting Screw) |
| 5 | 183021 | Retainer, Spring |
| 6 | 315424 | Adjusting Spring, 60-PSI |
| | 183020 | Adjusting Spring, 100-PSI |
| 7 | 130174 | Diaphram Ass'y |
| 8 | 183011-047 | Baffle |
| 9 | 130167 | Guide |
| 10 | 183010 | Gasket |
| 11 | 183009-007 | Retainer, Seat |
| 12 | 183008 | O-Ring, .489 I.D. By .070 C.S. |

| Item No. | Part No. | Name |
|---|---|---|
| 13 | 183007 | Filter Screen |
| 14 | 183006 | Spring, Poppet |
| 15 | 130170 | Valve, Poppet |
| 16 | 130168 | Reducing Valve Seat |
| 17 | 183003 | Gasket, Seat |
| 18 | 183001-015 | Body |
| 19 | 183047 | Fitting, 1/4-NPT |
| 20 | 183061 | Fitting, 1/4-NPT By 7/16-20 |
| 21 | 187485 | Fitting, Elbow, 1/4-NPT By 7/16-20 |
| 22 | 183068 | Fitting, Elbow, 1/4-NPT |
| 23 | 183301-001 | Check Valve Ass'y with Adapter (Includes 24-30) |
| 24 | 183300-001 | Adapter |
| 25 | 183320-100 | Check Valve Ass'y (Includes 26-30) |
| 26 | 183294 | Quad Ring, .145 I.D. By .070 C.S. |
| 27 | 183296 | Ball |
| 28 | 183297 | Spring |
| 29 | 183298 | Retainer |
| 30 | 183295-100 | Body |
| 31 | 183317 | Bracket, Regulator |
| 32 | 321811 | Hex Nut, Keps, 1/4-20 |
| 33 | 324211 | Fitting, 1/16-NPT By 5/32-Barb |

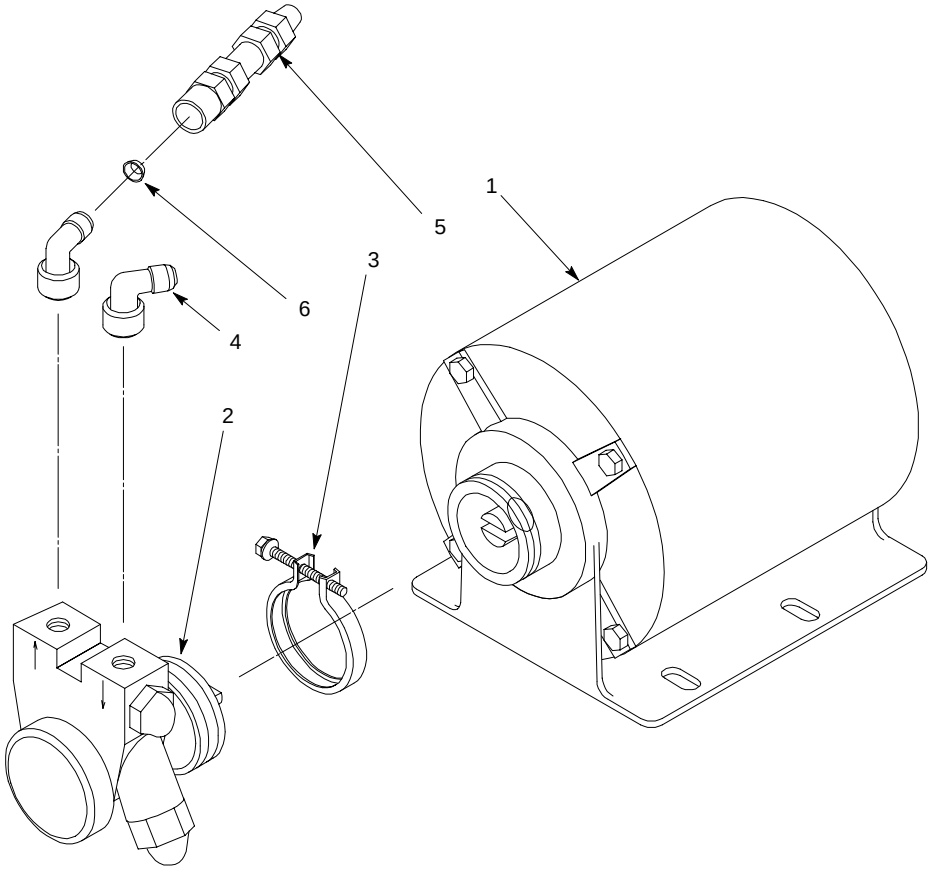



**FIGURE 23. PUMP AND MOTOR ASS'Y**

| Item | Part | Description |
|---|---|---|
| | 324157 | Pump and Motor Ass'y, 115V 60HZ |
| | 199020 | Pump and Motor Ass'y 230V 50HZ |
| 1 | 300626 | Motor, 230V 60HZ |
| 2 | 312996 | Pump, Water, 90 G.P.H. |
| 3 | 187483 | Clamp, Pump to Motor |

| Item | Part | Description |
|---|---|---|
| 4 | 187502 | Fitting, Elbow, 3/8 MPT by 7/16-20 |
| 5 | 311765-001 | Dual Check Valve Ass'y (see FIGURE 24) |
| 6 | 178025-100 | Tapered Gasket, White |

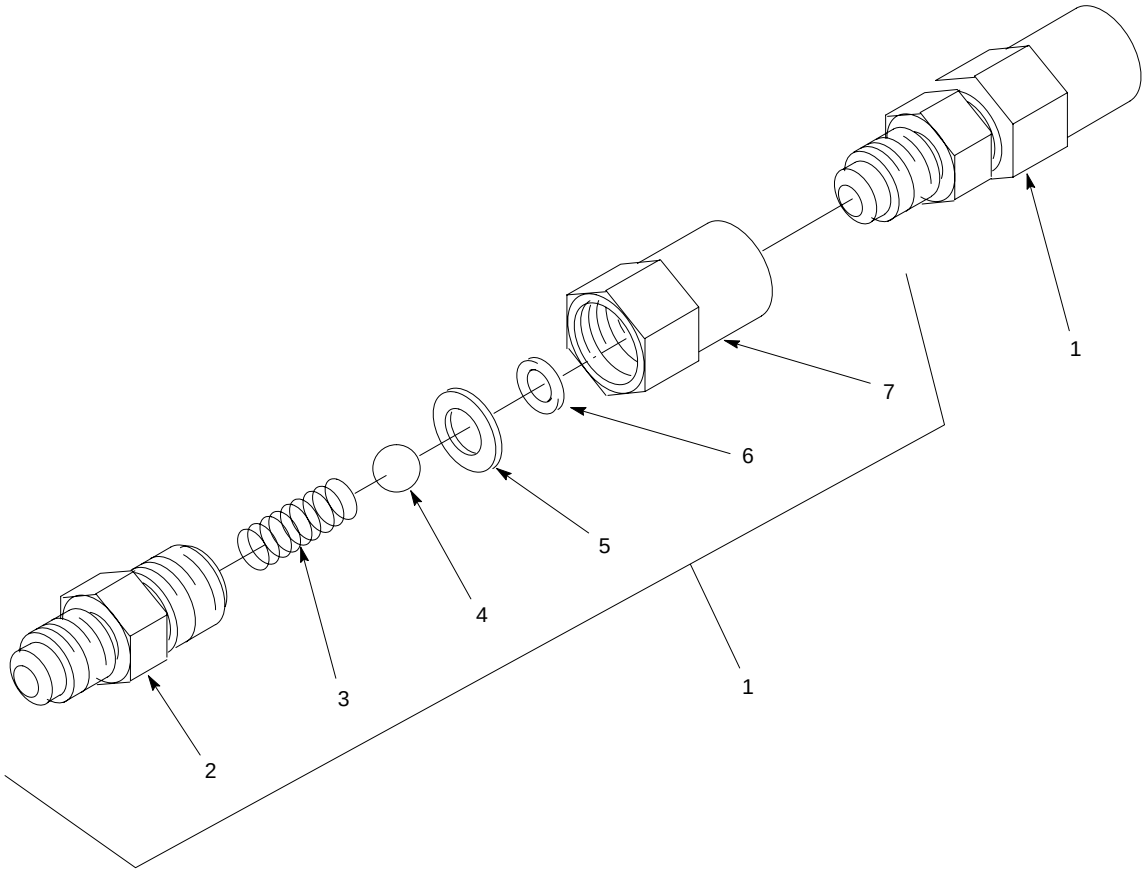



**FIGURE 24. DOUBLE CHECK VALVE ASSEMBLY**

| Item | Part | Description |
|---|---|---|
| | 311765-001 | Double Check Valve Ass'y |
| 1 | 311764-001 | Single Check Valve Ass'y (includes 2-7) |
| 2 | 317965 | Retainer |

| Item | Part | Description |
|---|---|---|
| 3 | 312196 | Spring |
| 4 | 312419 | Ball |
| 5 | 312415 | Washer, .300 I.D. |
| 6 | 312418 | Quad Ring, .329 I.D. |
| 7 | 317963 | Receptacle |

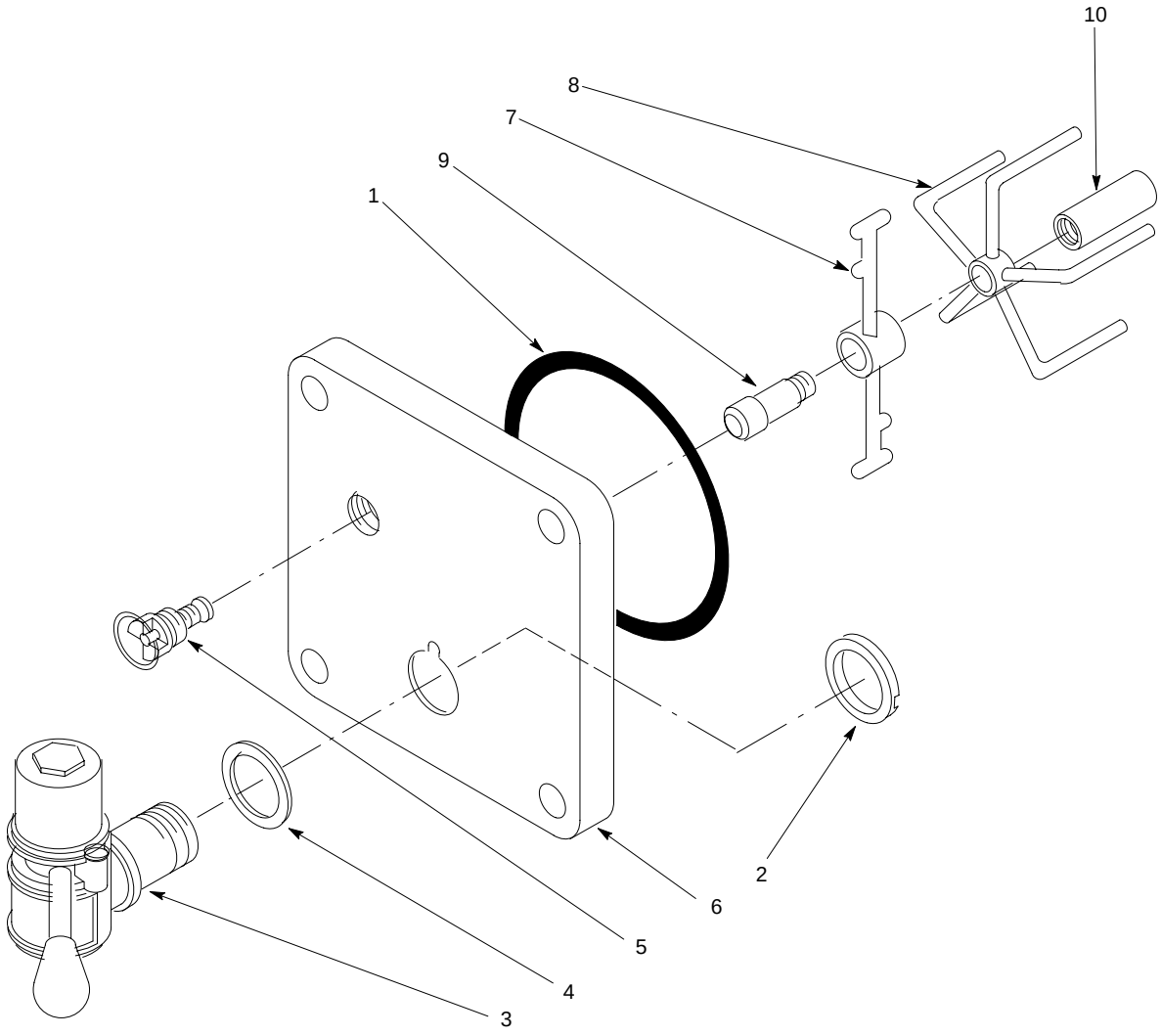



**FIGURE 25. FACEPLATE ASSEMBLY**

| Item | Part | Description |
|---|---|---|
| | 326106 | Door, Freeze Cylinder Ass'y |
| 1 | 320678 | O-Ring, 4.60 I.D. by .210 C.S. |
| 2 | 321652 | Shank Nut |
| 3 | 1557 | Valve Head Ass'y (see Figure 6-9) |
| 4 | 325936 | Spacer |

| Item | Part | Description |
|---|---|---|
| 5 | 325954 | Relief Valve Ass'y |
| 6 | 325918 | Door, Freeze Cylinder |
| 7 | 321269-001 | Spinner |
| 8 | 322441 | Sensor |
| 9 | 2361 | Shaft |
| 10 | 2358 | Pin |

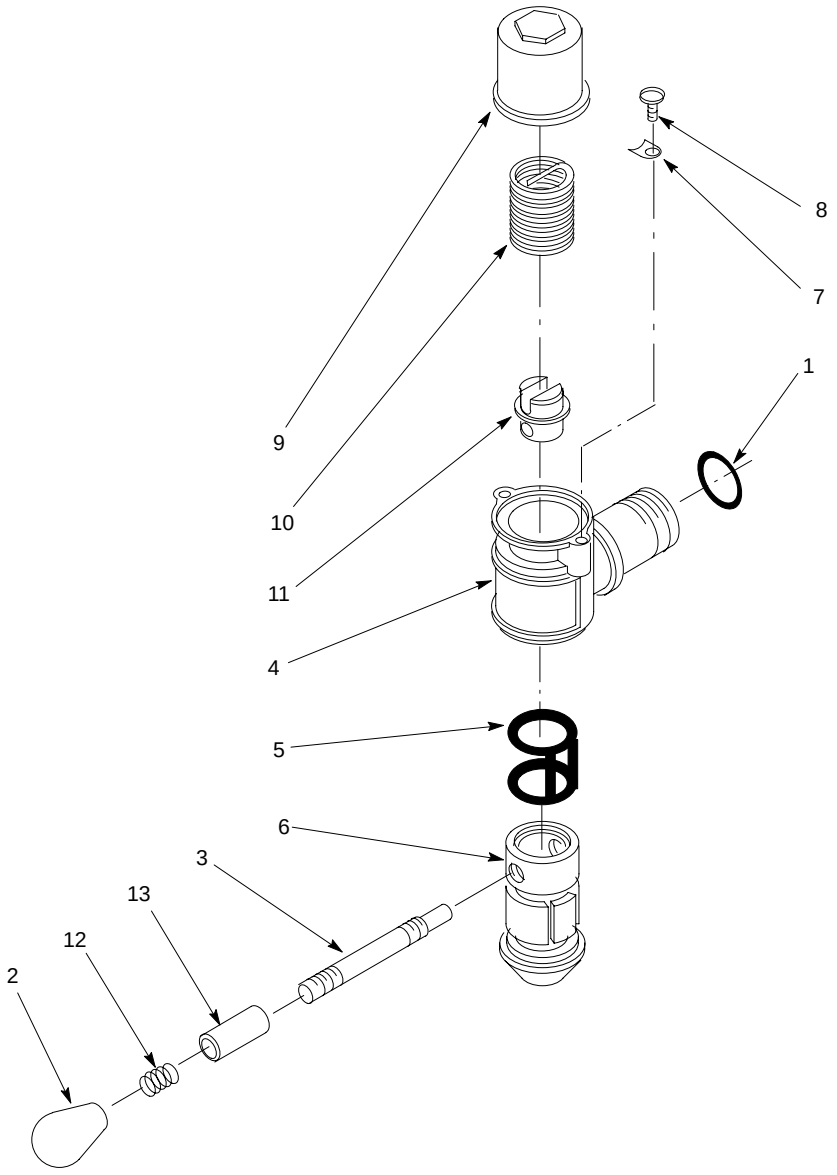


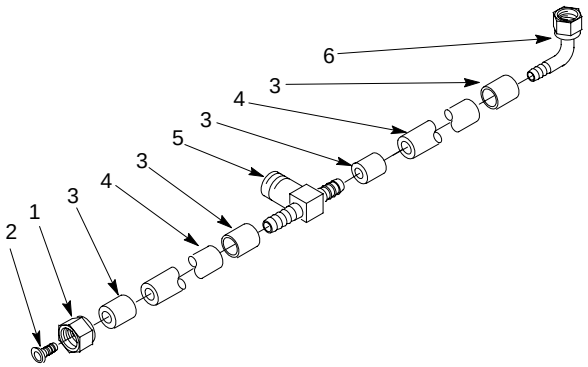

**FIGURE 26. DISPENSING VALVE ASSEMBLY**

| Item | Part | Description |
|---|---|---|
| | 1557 | Dispensing Valve Ass'y |
| 1 | 321653 | O-Ring, .862 by .103 C.S. |
| 2 | 1555 | Knob |
| 3 | 321651 | Lever, Valve |
| 4 | 1556 | Body and Shank |
| 5 | 2818 | O-Ring, Caged, .562 I.D. by.210 C.S. |
| 6 | 1554 | Valve |

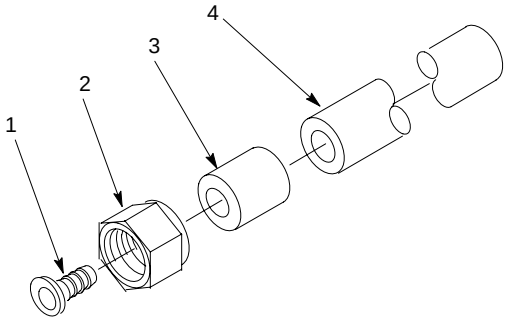
| Item | Part | Description |
|---|---|---|
| 7 | 325647 | Plate |
| 8 | 317784 | Thread cutting Screw, Phil Truss HD; Stainless Steel, No. 8-32 by 3/8-in. |
| 9 | 1576 | Housing |
| 10 | 325305 | Spring |
| 11 | 1575 | Fitting |
| 12 | 1544 | Spring |
| 13 | 1543 | Shaft Release |

## FIGURE 27. TUBING ASSEMBLY

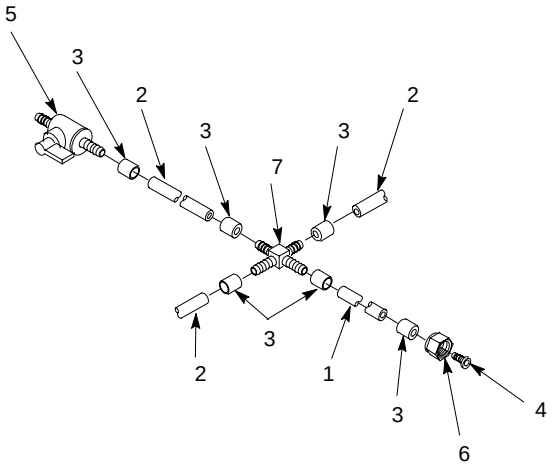
| Item | Part | Description |
|---|---|---|
| | 2815 | Tube Ass'y, .250 I.D. |
| 1 | 176017 | Swivel Nut, 7/16-20 |
| 2 | 770104 | Nipple, for .250 I.D. Tube |
| 3 | 176000 | Ferrule, 47 Jaw, for .465 O.D. Tube |
| 4 | **174478 | Tube, .265 I.D. by 3-in. Long<br>Tube, .265 I.D. by 92-in. Long |
| 5 | 770698 | Fitting, Tee, 1/4-Barb by 1/4 NPT |
| 6 | 770460 | Fitting, Swivel Elbow, 5/8-18 |




| Item | Part | Description |
|---|---|---|
| | 176272-396 | Tube Ass'y, .375 I.D. |
| | 174061-196 | Tube Ass'y, .265 I.D. |
| | 325558 | Tube Ass'y, .250 I.D. |
| 1 | 176205 | Nipple for .375 I.D. Tube |
| | 770104 | Nipple, for .265 I.D. and .250 I.D. Tube |
| 2 | 311242 | Swivel Nut, 5/8-18 |
| | 176017 | Swivel Nut, 7/16-20 |
| 3 | 176204 | Ferrule, for .610 O.D. Tube |
| | 176000 | Ferrule, for .520 O.D. Tube |
| | 176001 | Ferrule, for .395 O.D. Tube |
| 4 | **174292 | Tube, .375 I.D. by 96-in. Long |
| | **174478 | Tube, .265 I.D. by 96-in. Long |
| | **174103-001 | Tube, .250 I.D. by 40-in. Long |

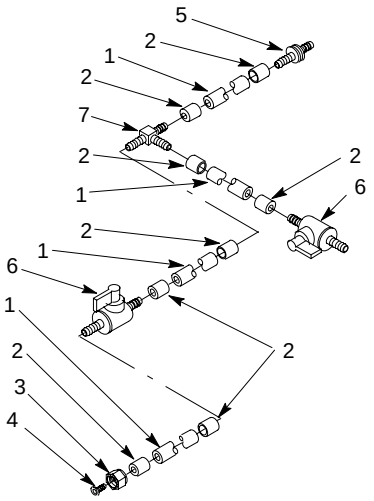



| Item | Part | Description |
|---|---|---|
| | 324169 | Tube Ass'y Carb. Water |
| 1 | **174103-001 | Tube, .250 I.D. by 15-in. Long |
| 2 | **174103<br>**174103<br>**174103 | Tube, .250 I.D. by 15-in Long<br>Tube, .250 I.D. by 4-in Long<br>Tube, .250 I.D. by 6-in Long |
| 3 | 176001 | Ferrule, 40 Jaw, for .395 O.D. Tube |
| 4 | 770104 | Nipple, for .250 I.D. Tube |
| 5 | 325012 | Shut-off Valve |
| 6 | 176017 | Swivel Nut, 7/16-20 |
| 7 | 770602 | Fitting, Cross, 1/4 Barb |

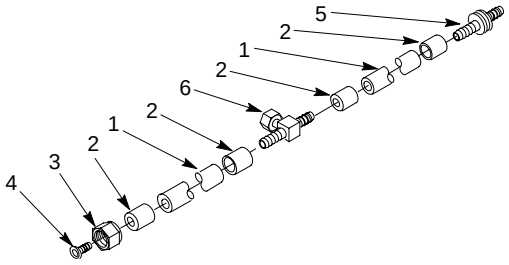


## FIGURE 27 TUBING ASSEMBLY (CON'T)

| Item | Part | Description |
|---|---|---|
| | 1578 | Tube Ass'y Product |
| 1 | **174103 | Tube, .250 I.D. by 1-3/4-in. Long |
| | **174103 | Tube, .250 I.D. by 2-1/2-in. Long |
| | **174103 | Tube, .250 I.D. by 18-1/2-in. Long |
| | **174103 | Tube, .250 I.D. by 54-in. Long |
| 2 | 176001 | Ferrule, 40 Jaw, for .375 O.D. Tube |
| 3 | 176016 | Swivel Nut, 1/2-16 |
| 4 | 770204 | Nipple for .250 I.D. Tube |
| 5 | 1561 | Connector, Barb |
| 6 | 325012 | Shut-off Valve |
| 7 | 770601 | Fitting, Tee, 1/4-Barb |




| Item | Part | Description |
|---|---|---|
| | 324142 | Tube Ass'y Carb, Water and Syrup Regulator |
| | **174103 | Tube, .250 I.D. by 8-in. Long |
| | **174103 | Tube, .250 I.D. by 15-in. Long |
| | 176001 | Ferrule, 40 Jaw, for .395 O.D. Tube |
| | 176017 | Swivel Nut, 7/16-20 |
| | 170104 | Nipple for .250 I.D. Tube |
| | 311742 | Connector, Barb |
| | 770652 | Fitting, Tee, 1/4 Barb by 7/16-20 |



# WARRANTY

IMI Cornelius Inc. warrants that all equipment and parts are free from defects in material and workmanship under normal use and service. For a copy of the warranty applicable to your Cornelius, Remcor or Wilshire product, in your country, please write, fax or telephone the IMI Cornelius office nearest you. Please provide the equipment model number, serial number and the date of purchase.

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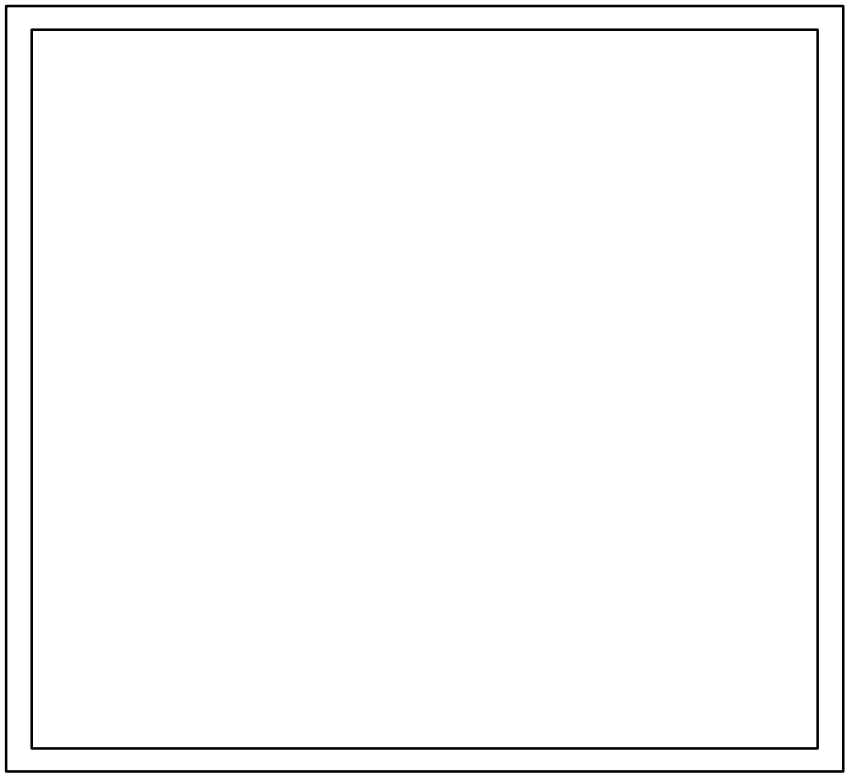

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